

FASD Prevention: An Annotated Bibliography of Articles Published in 2022

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Executive Summary

Introduction

Annually, researchers associated with the Prevention Network Action Team (pNAT) of the CanFASD Research Network search the academic literature for articles related to Fetal Alcohol Spectrum Disorder (FASD) prevention. The findings are organized using a [four-level prevention framework](#) developed by the pNAT to describe the wide range of work that comprises FASD prevention. The annual literature search is intended to update those involved in FASD prevention in Canada, so they can inform their practice and policy work with current evidence. The members of the pNAT also have the opportunity in monthly web meetings to discuss the implications of the findings for their work.

Search Methods

Six databases were searched using EBSCO Host for articles published between January and December 2022. All searches were limited to articles published in the English language. Articles were further screened for relevance to the FASD pNAT, and non-relevant articles (e.g., diagnosis of FASD) were removed from the list. Articles were then categorized into one or more theme, as presented below.

Search Results

One hundred thirteen ($n = 113$) articles were included from our searches. Twelve ($n = 12$) articles were assigned to more than one category and nine ($n = 9$) were attributed to more than one country. Table 1 (pg. 3) provides an overview of the number of articles found in each topic area by country. In the past year, English-language research on FASD prevention was most often generated in the United States of America (US), Australia, Canada, and the United Kingdom (UK).

Prevalence of, and influences and factors associated with, alcohol use in pregnancy

Thirty-seven ($n = 37$) articles explored the prevalence of, and influences and factors associated with, alcohol use during pregnancy. The majority of studies were cross-sectional ($n = 24$), followed by systematic review and meta-analyses ($n = 4$), qualitative ($n = 3$), case control ($n = 2$), cohort ($n = 2$), and review ($n = 2$).

The prevalence of alcohol use was reported to be as high as 50.5% at any time during pregnancy [1] to as low as 0.1% [2].

We continue to see a wide range of factors associated with alcohol use during pregnancy including:

- Pre-pregnancy alcohol use [3-8]
- Older age [5, 6, 9, 10] or younger [11]
- Unplanned pregnancy [3, 12, 13]
- Frequent or binge drinking [14-16]
- Use of alcohol to cope [7, 8, 17]
- Pre-pregnancy substance use [6, 16]
- Tobacco use [12, 15]
- Poor social support [3, 17]
- Illiteracy [5] or less formal education [6]
- Partner's alcohol use [5]
- Abortion history [12]
- Physical violence during pregnancy [12]
- Adverse childhood experiences [18]
- Acculturation (in the US) [19]
- Being married [11] or not being married [20]
- Being divorced/widowed [20]
- Living in a rural area [20]
- Not being a homeowner [11]
- Mid-level education [11]
- Late pregnancy recognition [6]
- Being employed [9]
- Cannabis use [21]

Several studies explored perceptions influencing alcohol use in pregnancy, for instance: women's perceptions that they were healthy enough and did not need preconception care [1], that alcohol use was safe [7, 10], that use during pregnancy had a low to medium risk [5], and that certain forms of alcohol were or safer than others [22] contributed to alcohol use during pregnancy. Two studies also examined perceptions related to alcohol guidance. One study found that ongoing alcohol use during pregnancy was also associated with disagreement with health-related statements, such as that avoiding alcohol use in pregnancy is safest [10]. Another systematic review found that reasons for occasional drinking during pregnancy included lack of reliable information; inadequate information from health care professionals; women's perception of public health messages; women's experiences and perceptions of risk; and social norms and cultural context [23].

Several studies also explored the societal pressure to drink [7, 8], the social benefits of using substances [17], alcohol use norms and the lack of activities that do not involve alcohol [8]. One US study examined how women engaged in sex work who use understand their pregnancy. The findings found three frameworks to describe their experiences: 1) pregnancy being an intervention that prompted additional scrutiny of substance use; 2) intensified stigma; and 3) being part of a system that prioritizes fetal health over maternal wellbeing [24].

Level 1 Prevention

Eleven ($n = 11$) articles described Level 1 FASD prevention efforts. The study designs greatly varied and included qualitative ($n = 3$), systematic reviews ($n = 2$), cross sectional studies ($n = 2$), review ($n = 1$), editorial ($n = 1$), experimental ($n = 1$), cross-sectional ($n = 1$), and analysis ($n = 1$).

Three studies discussed pregnancy warning labels. Two described industry and policy influence on pregnancy warning labels, including a study from France which found that the alcohol industry was seldom in support of pregnancy warning labels, frequently questioned the efficacy, and argued that warning labels would be both counterproductive to women and the wider economy [25].

Several studies described the elements and approaches to delivery of health promotion campaigns delivered through radio and television ads, Twitter messages, social marketing platforms and broad media efforts. The authors discussed the benefits of developing locally tailored messages; clear, trustworthy and believable messages; and, culturally responsive messages with Indigenous communities that focus on collective responsibility and community action.

Level 2 Prevention

Thirty one ($n = 31$) articles described Level 2 prevention efforts. Study designs included qualitative ($n = 5$) and systematic review and meta-analyses ($n = 5$), cross sectional ($n = 3$), clinical trials ($n = 3$), randomized controlled trial ($n = 3$), review/scoping review ($n = 2$), editorials ($n = 2$), commentary ($n = 2$), brief report ($n = 1$), criterion validation ($n = 1$), mixed methods ($n = 1$) and quasi-experimental ($n = 1$).

Several articles considered issues and practices related to screening for alcohol use in the perinatal period. The articles addressed ethical challenges associated with screening using biomarkers, the limitations of generic screening approaches versus ones that take psychosocial concerns into account, women's preferences for certain screening tools (such as the 4P's Plus), effectiveness of training for health care professionals, and barriers to disclosure of alcohol use and how to mitigate these through relational practice.

Studies about the provision of brief advice and brief interventions varied in aim, with several reporting on the efficacy of brief interventions. Brief interventions developed with Indigenous communities were described, including a culturally safe mobile health (mHealth) intervention. In 2022, there was more research on the use, barriers and benefits of brief interventions delivered by a range of providers including physicians, nurses, midwives, pharmacists, and nutritionists. Several studies assessed the effectiveness of digital interventions, often finding that computer/internet-based interventions were effective in helping women reduce alcohol use.

A commentary examined the trends, sociolegal implications, and nursing practice and research related to women with substance use disorders over the past 50 years. The authors provide policy and practice recommendations, including the implementation of gender-, trauma-, and harm-reduction-informed approaches to screening and treatment; brief intervention; support for the mother-infant dyad; cross-sectoral collaboration; and, equity- and gender-informed practice and policy [26].

Level 3 Prevention

Thirteen ($n = 13$) articles described Level 3 prevention efforts. Study designs included before and after ($n = 3$), case control ($n = 2$), cross sectional ($n = 2$), qualitative ($n = 2$), review/scoping review ($n = 2$), mixed methods ($n = 1$) and commentary ($n = 1$).

Addressing this level of prevention, authors considered the pathways, facilitators, barriers, models and impacts of treatment and support for women with substance use concerns,

Several papers described live-in and outpatient programming for pregnant and postpartum women. A hospital based outpatient program in Chile used an accompaniments model to reduce equity gaps and address social and structural barriers to treatment. One Canadian study identified and examined the use and uptake of complementary therapies in a substance use recovery program for pregnant women and girls. Two peer support programs were described, including a virtual peer support program where participants in a 12-week virtual peer support program found the virtual space a comfortable and safe space where participants were able to develop community [27].

A scoping review on the pathways, facilitators, and barriers to treatment for pregnant and parenting women found that women were motivated to seek treatment by personal and child-related factors (i.e., loss of children, suspension or termination of parental rights, the anticipation of reuniting with children). Major access barriers included fear, stigma, charges of child abuse, inconvenience, and financial hardship [28].

Level 4 Prevention

Thirteen ($n = 13$) articles described Level 4 prevention efforts. Study designs included randomized controlled trial ($n = 3$), before and after ($n = 2$), cross sectional ($n = 2$), review/scoping review ($n = 2$), qualitative ($n = 1$), mixed methods ($n = 1$), case control ($n = 1$), and conceptual model ($n = 1$).

Level 4 efforts largely described home visitation programs, including the Family Spirit® program in the US, [29] as well as the risk factors and parental satisfaction in an Australian home visitation program that provided tailored content for women with smoking and mental health risks as well as domestic violence and drug and alcohol risks [30, 31].

Supportive Alcohol and Child Welfare Policy

Twelve ($n = 12$) articles described supportive alcohol and child welfare policy. Study types included commentaries ($n = 2$), discourse analysis ($n = 2$), review ($n = 2$), retrospective ($n = 1$), practice paper ($n = 1$), editorial ($n = 1$), review ($n = 1$), policy paper ($n = 1$), cross sectional ($n = 1$), and qualitative ($n = 1$).

Two studies reported on collaborative efforts to prevent FASD and advance comprehensive integrated and supportive care for mothers and children, including the Centre of Research Excellence as part of FASD Research Australia, and a national consortium in the Netherlands, that help propel FASD (prevention) efforts forward [32, 33].

A US study that assessed the characteristics of infants prenatally exposed to prenatal substance use in relation to Plans of Safe Care referrals. The study found that 93% of families had Plans of Safe Care support and nearly 90% avoided out-of-home-placement. Plans of Safe Care were seen as critical in fostering

support and creating protective linkages to community-based programs for infants prenatally exposed to substances and their families [34].

Several studies examined reporting policies, for example one US and Australian study explored duty to report and found that the differences in substance use and pregnancy laws draw attention to the inconsistencies, and how reforms could be made to improve provision and support in both countries [35].

Other – stigma, ethical issues, and systemic approaches

Twelve ($n = 12$) articles described other related topics, such as stigma, ethical issues, and systemic approaches. Study types included qualitative ($n = 4$), commentaries ($n = 2$), review/scoping review ($n = 2$), cross sectional ($n = 2$), cohort ($n = 1$), and simulation modelling study ($n = 1$).

A range of issues were covered by these twelve articles such as the opportunities and challenges presented by social media when using it as a qualitative data source[36], factors associated with beliefs by healthcare providers in stigmatizing, punitive approaches [37] and the benefits of comprehensive care networks in mitigating stigma [38].

In summary

Valuable evidence on FASD prevention is generated each year by researchers across the world. It is important to gather, synthesize and discuss this literature in order to guide our efforts in each of the four levels of prevention, in developing supportive alcohol and child welfare policy, and in considering ethical and destigmatizing considerations.

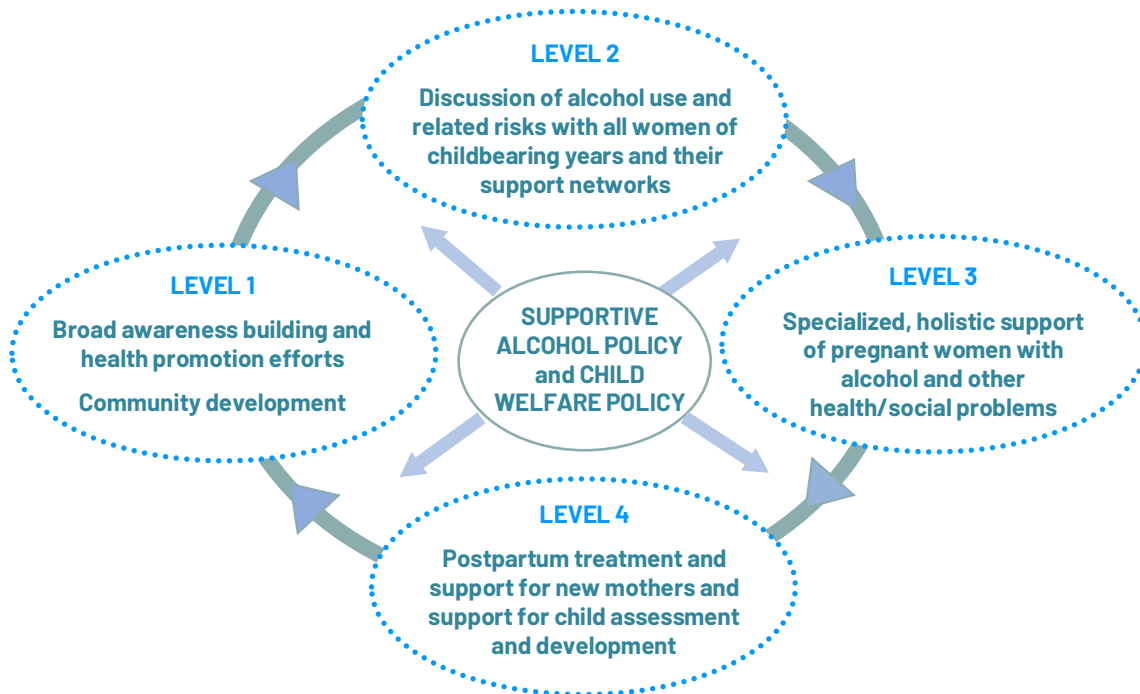
FASD Prevention Literature Search 2022

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Search Methods

The following databases were searched using EBSCO Host for articles published between January and December 2022:

1. Bibliography of Native North Americans
2. CINAHL Complete (Cumulative Index of Nursing and Allied Health Literature)
3. MEDLINE with Full Text
4. PsycINFO
5. Social Work Abstracts
6. Urban Studies Abstracts

Searches of each database were conducted using the following search terms: 1)[Fetal Alcohol Spectrum Disorder OR FASD OR fetal alcohol OR foetal alcohol OR alcohol exposed pregnancy OR alcohol] + [pregnancy] + [prevention OR preventing OR preventative]; 2)[Alcohol OR drink*] + [pregnan* OR conception OR preconception OR postpartum OR prenatal OR antenatal OR perinatal or maternal] + prevention; 3)[Alcohol OR drink*] + prevention + [women OR girls OR youth OR teen* OR mother OR Aboriginal OR Indigenous OR First Nation* OR Inuit OR Métis]; 4)[Alcohol OR drink* OR FASD] + [awareness OR education OR policy] + [women OR girls OR female OR mother]; 5)[Alcohol OR drink*] + intervention* + [women OR girls OR female OR mother]; 6)[Alcohol OR drink*] + stigma + [women OR girls OR female OR mother]; 7)[Alcohol OR drink*] + [motivational interviewing OR Screening OR brief intervention OR SBIR OR SBIRT] + [women OR girls OR gender OR female OR mother OR pregnan*]; 8)[Alcohol or drink*] + [home visit* OR NICU OR neonatal intensive care unit OR midwives or midwife or midwifery]; 9)[Pregnan* OR conception OR preconception OR post-partum OR mother] + [substance use treatment OR harm reduction]; 10)[Pregnan* OR conception OR preconception OR post-partum OR mother] + [wraparound OR parent child assistant program OR PCAP OR community OR holistic OR integrated OR multidisciplinary]; 11)[Alcohol OR drink*] + [land-based OR cultur*] + [women OR girls OR youth OR teen* OR mother OR Aboriginal OR Indigenous OR First Nation* OR Inuit OR Métis];

All searches were limited to articles published in the English language. Articles were further screened for relevance to the FASD pNAT, and non-relevant articles (e.g., diagnosis of FASD) were removed from the list. Articles were then categorized into one or more theme, as presented below.

Search Results

One hundred thirteen ($n = 113$) articles were included from our searches. Twelve ($n = 12$) articles were assigned to more than one category and nine ($n = 9$) were attributed to more than one country. Table 1 provides an overview of the number of articles found in each topic area by country. English-language research on FASD prevention was most often generated in the United States of America (US), Australia, Canada, and the United Kingdom (UK).

Table 1: Studies identified by topic and country

Country	Prevalence	Level 1	Level 2	Level 3	Level 4	Policy	Stigma	Total
Argentina	0	0	1	0	0	0	0	1
Australia	3	5	9	1	3	3	1	25
Belgium	0	0	0	0	0	0	1	1
Brazil	1	0	0	0	0	0	0	1
Burundi	1	0	0	0	0	0	0	1
Canada	5	1	3	2	1	1	3	16
Chile	0	0	0	1	1	0	0	2
Ethiopia	5	0	0	0	0	0	0	5
France	0	2	1	0	0	0	0	3
Germany	0	1	1	0	0	0	1	3
Ghana	1	0	0	0	0	0	0	1
Ireland	1	0	0	0	0	0	0	1
Israel	0	0	1	0	0	0	0	1
Italy	0	0	1	0	0	0	0	1
Jamaica	1	0	0	0	0	0	0	1
Liberia	1	0	0	0	0	0	0	1
Mongolia	1	0	0	0	0	0	0	1
Nigeria	2	0	0	0	0	0	0	2
Pakistan	1	0	0	0	0	0	0	1
Poland	0	1	0	0	0	0	0	1
Romania	1	0	0	0	0	0	0	1
Russia	1	0	0	0	0	0	0	1
South Africa	3	0	0	0	0	1	0	4
South Korea	0	0	1	0	0	0	0	1
Spain	1	0	0	0	0	0	0	1
Switzerland	2	0	0	0	0	0	0	2
The Netherlands	0	1	1	0	0	0	0	2
The Philippines	1	0	0	0	0	0	0	1
Uganda	0	0	1	0	0	0	0	1
UK	3	1	4	0	0	1	3	13
US	11	0	7	9	8	5	4	44
Vietnam	1	0	0	0	0	0	0	1
Zimbabwe	1	0	0	0	0	0	0	1
	48	12	32	13	13	11	13	142

A. Prevalence of, and influences and factors associated with, alcohol use in pregnancy

1. **Abetew, M.M., Alemu, A.A., Zeleke, H, Ayenew, A. A., Aynalem, F. G., Kassa, G. M. & Khajehi, M. (2022). Alcohol consumption and its determinants among pregnant women in Gozamin district, Amhara, Ethiopia, 2020. *SAGE Open Medicine*, 10. doi:10.1177/20503121221130903**

This Ethiopian study describes the prevalence and determinants of alcohol consumption among pregnant women in Gozamin district, in 2020. A community-based cross-sectional study was employed, involving $n = 555$ pregnant women. The prevalence of alcohol use among the participants was 45.6%. Determinants of alcohol included: highest wealth index (adjusted odds ratio = 3.21), pre-pregnancy alcohol consumption (adjusted odds ratio = 3.67), poor social support (adjusted odds ratio = 3.08), and unplanned pregnancy (adjusted odds ratio = 1.66). The authors found that prevalence of alcohol consumption was high among the pregnant women and many of the determinants were similar to global findings. The authors highlighted the importance of introducing policies and interventions that raise awareness of the harms of alcohol use in pregnancy and address the determinants that facilitate reduction in alcohol use during pregnancy.

2. **Adeoye, I.A. (2022). Alcohol consumption and tobacco exposure among pregnant women in Ibadan, Nigeria. *BMC Psychiatry*, 22, 570. <https://doi.org/10.1186/s12888-022-04210-9>**

This Nigerian study explored the prevalence, pattern and predictors of alcohol consumption and tobacco exposure among pregnant women in Ibadan. Data from a prospective cohort study was used and alcohol consumption and tobacco exposure of $n = 1745$ pregnant women were assessed during enrollment by self-reports using an interviewer-administered questionnaire. The prevalence of pre-pregnancy alcohol consumption and alcohol consumption during pregnancy were 31.7% and 12.7%, respectively. Palm wine (52%) and beer (12%) were the most common types of alcohol consumed among pregnant women. A key predictor of alcohol consumption during pregnancy was pre-pregnancy alcohol use. Affiliation with some religions was a protective factor. The prevalence of tobacco exposure in the index pregnancy was 3.7%. Pre-pregnancy cigarette smoking was reported by 1.9% of study participants and was the most significant predictor of tobacco exposure during pregnancy. The authors conclude that alcohol consumption and tobacco exposure are not uncommon, are commonly neglected, and need to be addressed through antenatal care policy and programmes.

3. **Adiri, C. O., Asimadu, E. E., Nwafor, M. I., Nweze, S. O., & Ukaegbe, C. I. (2022). Perception of safety and consumption of alcoholic beverages during pregnancy. *Journal of obstetrics and gynaecology; the journal of the Institute of Obstetrics and Gynaecology*, 42(7), 3021–3025. <https://doi.org/10.1080/01443615.2022.2125795>**

This Nigerian study examined pregnant women's perceptions of the safety of alcohol use during pregnancy. Women ($n = 506$) recruited from antenatal clinics completed a questionnaire on what alcoholic beverages they consider to be safe to drink during pregnancy and their consumption levels. Women considered palm wine, stout, beer, alcoholic wine, ogogoro, and gin/spirits to be safe. Those who perceived specific alcohol types as safe to drink during pregnancy were more at risk of consuming that beverage while pregnant. Healthcare workers should discuss perceptions of safety of alcoholic beverages with their patients and provide specific information on the prenatal risk to aid in preventing alcohol use in pregnancy.

4. **Allen, L., Wodtke, L., Hayward, A., Read, C., Cyr, M. & Cidro, J. (2022). Pregnant and early parenting Indigenous women who use substances in Canada: A scoping review of health and social issues, supports, and strategies. *Journal of Ethnicity in Substance Use*. <https://doi.org/10.1080/15332640.2022.2043799>**

This scoping review from Canadian authors reviewed and synthesized the literature on Indigenous women who are pregnant and parenting in Canada and use substances. The scoping review found 56 academic and grey literature articles that highlighted the repercussions of child removal; barriers and inequities; the prevalence of substance use; and intervention strategies. Indigenous women who binge drank alcohol during pregnancy were more likely to: be introduced to alcohol at a younger age, drink more frequently and heavily, use more cigarettes, cannabis, cocaine, and solvents before pregnancy, experience depression and distress in the past year, and experience more verbal aggression in intimate relationships. The findings further highlight that substance-involved Indigenous mothers have less access to maternity and infant care, as well as poorer pregnancy outcomes, as a result of stigma and a lack of trauma-informed and culturally safe care. Intervention strategies, such as psychosocial support, culturally safe midwifery care, peer support, trauma-informed, harm reduction oriented, wraparound support, and traditional healing practices are described.

5. **Corrales-Gutierrez, I., Baena-Antequera, F., Gomez-Baya, D., Leon-Larios, F., & Mendoza, R. (2022). Relationship between Eating Habits, Physical Activity and Tobacco and Alcohol Use in Pregnant Women: Sociodemographic Inequalities. *Nutrients*, 14(3), 557. <https://doi.org/10.3390/nu14030557>**

The aim of this Spanish study was to assess the association of healthy habits in relation to sociodemographic variables in a representative sample of pregnant women. Pregnant women at 20 weeks gestation were sampled. The findings indicate that women who are younger and have lower educational levels were more likely to have poor eating habits, higher smoking rates, and be less active. Pregnant women who did not smoke were more likely to possess better eating habits. Among women who consumed alcohol during pregnancy, coffee consumption was almost two-fold and folic acid use was lower. Health care providers and policy makers should be aware of these variables and encourage health habits through multiple risk behaviour prevention approaches.

6. **Daggy, J. K., Silver, R. M., Guise, D., & Haas, D. M. (2022). The Impact of Self-Reported Alcohol, Tobacco, and Recreational Drug Use during Pregnancy on Adverse Pregnancy Outcomes in First-Time Mothers. *American Journal of Perinatology*. <https://doi.org/10.1055/s-0042-1753502>**

This US study examined alcohol, tobacco, and recreational substance use during pregnancy in first time mothers in order to understand the association of substance use and risk of adverse pregnancy outcomes. An analysis of $n = 10,031$ pregnant women across eight medical centers in the US was conducted. The authors conducted a latent class analysis: tobacco users (5.2%), nonusers (89.2%), alcohol users (5.0%), and a combination of alcohol/tobacco/other substance users (0.7%). Tobacco users were more likely to have adverse pregnancy outcomes, preterm birth, and small for gestational age infants compared to nonusers. Alcohol users were more likely to have hypertensive disorder of pregnancy and less likely to have preterm birth and small for gestational age infants compared to nonusers. Intervention strategies are needed to reduce adverse pregnancy outcomes in pregnant women who use substances.

7. **Demeke, G. B. & Bayu, E. K. (2022). Assessment of alcohol utilization during pregnancy and its associated factors among reproductive women in Mecha Woreda of North Western Ethiopia. *BMC Women's Health*, 22(1), 189. <https://doi.org/10.1186/s12905-022-01776-0>**

This community-based study from Ethiopia investigated the prevalence and associated factors of alcohol use during pregnancy. The prevalence of alcohol use among was high (19%). A number of characteristics were associated with alcohol use during pregnancy, including older age (35-49 years), illiteracy, and pre-pregnancy alcohol use. Patterns of use and attitudes towards alcohol use during pregnancy were associated with use, including use of alcohol with their husband, perceiving that alcohol use during pregnancy poses low or medium risk, and the perception that drinking during pregnancy is valuable. The authors highlight that cultural and communal influences on alcohol use during pregnancy differ across regions and countries, effecting the prevalence of alcohol use in pregnancy and prevention efforts.

8. **Dewey, S., Brown, K., Hankel, J., & Anasti, T. (2022). "I was already in the system from the start": How substance-using women in the street sex trade make decisions about pregnancy. *Drugs: Education, Prevention and Policy*, 29(2), 150 – 159. <https://doi.org/10.1080/09687637.2021.1872496>**

This US study explored how women engaged in sex work who use substances understand their pregnancy and how it intersects with healthcare, social services, and the family system. Case files ($n = 125$) were qualitatively analyzed, and semi-structured interviews ($n = 55$) were conducted with women who became pregnant while engaging in substance use and sex work. Authors found three primary frameworks to describe participants experiences: 1) pregnancy being an intervention prompting additional scrutiny of substance use; 2) intensified stigma; and 3) being managed by a system that prioritizes fetal health over maternal wellbeing. Results indicate a need to understand and address the interplay of substance use, relationships, and pregnancy-related decision making to engage in strengths-based harm reduction.

9. **Duko, B., Bedaso, A., Wolka, S., Tantu, T., Wolde, D., & Ayano, G. (2022). The Prevalence of Alcohol Consumption Among Pregnant Women in Ethiopia: A Systematic Review and Meta-Analysis. *Maternal and Child Health Journal*, 26(9), 1800–1810. <https://doi.org/10.1007/s10995-021-03286-1>**

This systematic review and meta-analysis from Ethiopia examined the prevalence of alcohol use among pregnant women in Ethiopia. Fifteen studies with a total of $n = 6,361$ pregnant women were included. The authors found the prevalence of prenatal alcohol use in Ethiopia was 14.1%. The prevalence was reported to be lower in studies that used standardized alcohol screening/assessment tools compared to those that did not use standardized tools. Due to the significant number of women who drink during pregnancy in Ethiopia, early identification, intervention, and education strategies are recommended.

10. **Erdenetuya, B., Kwon, D., Choi, S., & Choe, S. A. (2022). Alcohol use during pregnancy: findings from a gender-based violence survey in Mongolia. *Archives of Women's Mental Health*, 25(4), 789–795. <https://doi.org/10.1007/s00737-022-01242-8>**

This Mongolian study explored the risk factors for alcohol use during pregnancy using the nationwide Gender-Based Violence Survey (2017). An analysis was conducted of women ($n = 2714$) who had given birth within 5 years of the survey and had responded to questions about their health-related behaviors during pregnancy. Alcohol use during pregnancy was reported in 5.4% of women. Unintended pregnancy for women (odds ratio = 1.95), abortion history (odds ratio = 1.89), smoking during pregnancy (odds ratio = 8.30), physical violence during pregnancy (odds ratio = 2.22), and binge drinking (odds ratio = 6.05) were associated with higher odds of alcohol use during pregnancy. Associations with maternal age, marital status, higher education, or multiparity were not evident. The findings provide knowledge of risk factors for alcohol drinking among pregnant women, and evidence that gender-based violence strategies can contribute to the development of effective FASD prevention strategies.

11. **Fletcher, T., Mullan, B., & Finlay-Jones, A. (2022). Perceptions of two different alcohol use behaviours in pregnancy: an application of the prototype/willingness model. *Health Psychology and Behaviour Medicine*, 10(1):1071–1085. <https://doi.org/10.1080/21642850.2022.2143362>**

This UK study explored whether 'ambiguous consumption' or 'small consumption' prototypes impacted perceptions of, and willingness to use, alcohol during pregnancy. Women aged 20 – 45 ($n = 140$), 92% of whom were previously or intended to become pregnant were included in the study. Women were assessed as to how favourably they viewed alcohol use in pregnancy, how similar they felt to the prototype that used alcohol during pregnancy, and how responsible they perceived the prototype to be. Participants who were exposed to the 'ambiguous consumption' prototype and had at least one child were more willing to accept an alcoholic beverage while pregnant. Those who were exposed to the 'small consumption' prototype rated higher in perceptions of favourability, similarity, and responsibility but not in willingness to drink. The results indicate that the perceptions of those who drink during pregnancy can differ according to the amount of alcohol they

see as typical. This can influence public health messaging around alcohol use in pregnancy, as acceptance regarding alcohol use may be associated with low to moderate, rather than no use.

12. **Greaves, L., Poole, N., & Brabete, A. C. (2022). Sex, gender and alcohol use: Implications for women and low-risk drinking guidelines. *International Journal of Environmental Research and Public Health*, 19(8), 4523. doi: 10.3390/ijerph19084523**

This review from Canadian authors collated research on the sex- and gender- related factors related to alcohol use by women. Research on sex-specific health effects pointed to different genetic, anatomical and physiological structures and processes, including females experiencing greater adverse health effects when consuming lower amounts of alcohol. Gender-related factors influencing women's drinking included negative gender norms and stereotypes, partner drinking, and experience of intimate partner violence. The review included ten studies focused on gender influences on pregnant women and mothers. This article supports the development of sex- and gender-specific lower risk drinking guidelines, in order for consumers and providers to have more nuanced and educative information.

13. **Hammer, R., & Rapp, E. (2022). Women's views and experiences of occasional alcohol consumption during pregnancy: A systematic review of qualitative studies and their recommendations. *Midwifery*, 111. <https://doi.org/10.1016/j.midw.2022.103357>**

This systematic review from Swiss authors reported women's perspectives on alcohol use during pregnancy and notions of alcohol guidance. Twenty-seven studies from eleven countries published between 2002 and 2019 were included. Identified reasons for occasional drinking during pregnancy included a lack of reliable information; inadequate information from health care professionals; women's perception of public health messages; women's experiences and perceptions of risk; and social norms and cultural context. Recommendations for prevention included improving health professional's knowledge and screening practice; diversification of information sources; improving women's information; empowering women's choice; delivering appropriate messages; and addressing socio-structural factors. Results indicate a broader context to prevention of alcohol use during pregnancy. To be successful, awareness strategies and prevention interventions should take into account socio-cultural factors that may contribute to perceptions and experiences of alcohol use during pregnancy.

14. **Hemady, C.L., Speyer, L.G., Murray, A.L. Brown, R. H., Meinck, F., Fry, D., Do. H., Sikander, S... & Eisner, M. (2022). Patterns of adverse childhood experiences and associations with prenatal substance use and poor infant outcomes in a multi-country cohort of mothers: a latent class analysis. *BMC Pregnancy Childbirth* 22, 505. <https://doi.org/10.1186/s12884-022-04839-0>**

This study explored the role of childhood adversity in perinatal substance use among mother-infant dyads in eight low- and middle-income countries. $N = 1189$ mother-infant dyads from the Evidence for Better Lives Study cohort were included in the study. A latent class analysis was conducted. Three high-risk classes and one low-risk class of adverse childhood experiences were identified: highly maltreated, emotionally and physically abused with intro-familial violence exposure, emotionally abused, and low household dysfunction and abuse. The analysis showed a higher probability of prenatal drug use in the highly maltreated and emotionally abused classes. Prenatal alcohol was not associated with the highly maltreated class, which the authors suggest may indicate the potential role of certain cultural norms as being protective in low- and middle-income countries. The study identified the role of differing, multifaceted profiles of maternal adverse childhood experiences on substance use and birth outcomes, and noted how this understanding can inform the design of antenatal support to better address these challenges.

15. **Hernandez, M., von Sternberg, K., & Velasquez, M. M. (2022). Alcohol use and problems among Latinas at risk of an alcohol-exposed pregnancy: The role of acculturation and interpersonal factors. *Journal of Ethnicity in Substance Abuse*, 21(2), 425–438. <https://doi.org/10.1080/15332640.2020.1777609>**

This US study aimed to increase knowledge of the risk factors associated with alcohol-exposed pregnancies in Latina women. Using data from Project CHOICES Plus (a randomized controlled trial to reduce alcohol and tobacco exposed pregnancies), a path analysis was conducted to examine the role of acculturation, helping relationships, partner status, age, and education on heavy drinking and alcohol use among $n = 119$ Latina adults in Texas at risk of an alcohol-exposed pregnancy (AEP). Helping relationships were ones where women could talk and be listened to about their drinking. Greater acculturation was positively associated with more helping relationships and heavy drinking. There was an indirect positive relationship between acculturation and alcohol problems, as well as between helping relationships and alcohol problems. A negative relationship between helping relationships and being partnered was reported. The authors conclude that knowledge of the mechanisms by which acculturation and interpersonal factors influence behavior change can inform potential targets for intervention among Latina women at risk of having an alcohol-exposed pregnancy.

16. **Hirth, J. M., Valadez, C., Gonzalez, S., Kowalchuk, A., Gutierrez, J. A., Zoorob, R. (2022). Racial/ethnic variations in alcohol and cigarette use by pregnancy status among 20- to 44-year-old women, NHANES 2001 – 2018. *Women's Health*, 18, <https://doi.org/10.1177/1745505722112188>**

This US study explored women's alcohol and cigarette use by pregnancy status and race/ethnicity. Data collected from $n = 10,019$ women aged 20 – 44 years included in the National Health and Nutrition Examination Survey was retrospectively analyzed in relation to pregnancy status and race/ethnicity of women. Smoking and alcohol use were considered in relation to race/ethnicity and pregnancy risk (classified by sexual behaviour, reproductive health, and prescription drug use). White women in the low pregnancy risk and pregnancy risk group smoked most frequently of the risk groups. However, among pregnant women, Black women had the highest smoking prevalence. Women in the pregnancy risk group were more likely to smoke compared to the low pregnancy risk group while those in the pregnant group were less likely to smoke. Black women in the pregnancy risk group were two times more likely to both smoke and drink compared with the low pregnancy risk group. Results indicate the need for pre-pregnancy interventions for alcohol and smoking cessation that are culturally appropriate while also providing access to contraception and sexual education.

17. **Howard, J.T., Perrotte, J.K., Flores, K., Leong, C., Nocito, J.D., & Howard, K.J. (2022). Trends in Binge Drinking and Heavy Alcohol Consumption Among Pregnant Women in the US, 2011 to 2020. *JAMA*, 5(8), <https://doi.org/10.1001/jamanetworkopen.2022.24846>**

This US study examined trends in heavy alcohol consumption in pregnant and non-pregnant women between 2011 and 2020 using public data from the Behavioural Risk Factor Surveillance Survey. Pregnant ($n = 49,098$) and non-pregnant ($n = 1,243,402$) women were included in the study. The authors found that, based on 30-day recall, the overall percentage of binge drinking and heavy alcohol consumption was higher in non-pregnant women. However, between 2011 and 2020, consumption increased in pregnant women at a higher rate than non-pregnant women. Results indicate a decrease in drinking cessation in pregnant women over the last decade, possibly due to increased socioeconomic and psychosocial stressors.

18. **Hutchinson, D., Spry, E. A., Mohamed Husein, H., Middleton, M., Hearps, S., Moreno-Betancur, M., Elliot, E. J., Ryan, J., Olsson, C. A., & Patton, G. C. (2021). Longitudinal prediction of periconception alcohol use: A 20-year prospective study across adolescence, young adulthood, and pregnancy. *Addiction*, 117(2), 343 – 353. <https://doi.org/10.1111/add.15632>**

This Australian longitudinal study examined periconception alcohol use, with the aim of examining the extent to which women modified their alcohol use following pregnancy recognition, the extent to which pre-pregnancy alcohol use predicts periconception use, and young adult predictors of consuming alcohol in the periconception period. The study was conducted as part of the Victorian Intergenerational Health Cohort Study, a prospective study of preconception predictors of child health. A sub-sample of $n = 289$ women with $n = 388$ pregnancies in third trimester of pregnancy were included. The authors found that alcohol use was common both pre-pregnancy and in the first few weeks of pregnancy; with similar levels of alcohol being consumed at both time periods. Those who drank periconceptionally had a history of frequent and/or binge

drinking in their adolescent and young adult years. Similarly, binge or frequent drinking as a young adult was a predictor of periconceptual alcohol use compared to those without prior drinking history. Public health initiatives should focus on pre-conception years and address social norms in young adults to prevent alcohol use in the periconception stage of pregnancy.

19. **Kassew, T., Liyew, B., Tarekegn, G. E., Wondie, M., Alamneh, T. S., Asnakew, S., & Shumet, S. (2022). Spatial distribution and determinants of alcohol consumption among pregnant women in Ethiopia: Spatial and multilevel analysis. *PLoS ONE*, 17(12): e0279405. <https://doi.org/10.1371/journal.pone.0279405>**

This objective of this study from Ethiopia was to examine the spatial variation and determinants of alcohol use among $n = 1,135$ pregnant women. Data from the 2016 Ethiopian Demographic and Health Survey was analyzed. The average prevalence of alcohol use during pregnancy was 22.49% with spatial distribution varying across the country. The highest prevalence of alcohol use in pregnancy was in in northwest and central Ethiopia. Alcohol use during pregnancy was associated with not being married, being divorced/widowed, having attended primary school, having two or more lifetime sexual partners, living in rural area and a higher community media exposure. The results indicate a need for targeted public health responses in areas with a high prevalence of alcohol use in pregnancy in order to reduce harm related to alcohol use and pregnancy.

20. **Kim, S. (2022). Exploring the Patterns of Substance Use Behaviors in a Nationally Representative Sample of Pregnant Women: A Latent Class Approach. *International Journal of Mental Health Addiction* <https://doi.org/10.1007/s11469-022-00886-y>**

This US study examined the substance use behaviours of pregnant women to better understand patterns of heterogeneous substance use and associated medical-sociodemographic profiles. Past-month use of tobacco, alcohol, marijuana, cocaine/crack, opioid/prescription pain relievers, and methamphetamine/prescription stimulants was collected from $n = 2,215$ pregnant women. Approximately one fifth (22.3%) reported past-month substance use. Those with past-month use were divided into five latent subclasses: Alcohol Only Users, Marijuana Only Users, Tobacco Only Users, Tobacco-Opioid Dual-Users and Polysubstance Users. The Alcohol Only Users and Marijuana Only users shared a similar medical-sociodemographic risk profile to that of non-users. To improve the health of pregnant women and their children, interventions should consider the heterogeneities of prenatal substance use behaviour and recognize a more thorough risk stratification process.

21. **Kloss, O., Jebb, M., Chartrand, L., Chudley, A. E., Eskin, M. N. A., & Suh, M. (2022). Dietary Intake Patterns and Lifestyle Behaviors of Pregnant Women Living in a Manitoba First Nations Community: Implications for Fetal Alcohol Spectrum Disorder. *Nutrients*, 14(15). doi: <https://doi.org/10.3390/nu14153233>**

This study investigated nutrition status, dietary intake, and lifestyle patterns of pregnant women living on a Northern Manitoba First Nations reserve. A total of $n = 37$ First Nations women were recruited, including 15 at-risk of having a child with FASD and 22 not-at-risk. Nutrient intake was assessed using a 24-hour recall questionnaire and nutrient values were determined using Dietary Reference Intakes (DRI). Both women at-risk and not-at-risk of FASD were below Canada Food Guide serving size recommendations, with 93% not meeting recommendations for vegetable and fruits, 92% not meeting recommendations for grains and 93% below recommendations for milk products. Additionally, 68% did not meet recommendations for folate and iron and 97% did not meet recommended docosahexaenoic acid (DHA) intake. Recommendations were met for vitamins A, B1, B12, C, as well as niacin, choline, calcium, and zinc. At-risk and not-at-risk women differed significantly in regards to mean % DRI intakes of vitamin C (313 ± 224 vs. 172 ± 81 mg/day), niacin (281 ± 123 vs. 198 ± 80 mg/day), folate (70 ± 38 vs. 10 ± 22 mcg/day), and iron (101 ± 74 vs. 74 ± 30 mg/day). This study highlights the need for community nutrition programs, nutrition education, and nutrition intervention, including community prenatal supplementation programs, in Northern Manitoba.

22. **Kotelnikova, Z. (2022). Prevalence of self-reported alcohol consumption among pregnant women in Russia between 1994 and 2018. *Alcoholism, Clinical and Experimental Research*, 46(5), 825–835. <https://doi.org/10.1111/acer.14798>**

This Russian study examined predictors of alcohol use and behaviours of pregnant and non-pregnant women of childbearing age from the larger Russian Longitudinal Monitoring Survey (1994 – 2018). Participants reported past 30-day alcohol use and current pregnancy status. The authors found that between 1994 and 2018, there was a decrease in the 30-day alcohol use in both pregnant and nonpregnant women. Despite an increase in pregnant abstainers between the years 2006–2018, the rate of occasional drinking in pregnant women remained consistent. Predictors for decreased alcohol use in pregnant women included time period, preventative check-ups, hospitalization, and frequent doctor's visits. While there has been a significant decrease in alcohol consumption in Russia, occasional drinking still poses a risk in pregnant women. Reliable, consistent information of the health risks of low amounts of alcohol is needed to shift perceptions.

23. **Maas, V. Y. F., Poels, M., de Kievet, M., H., Hartog, A. P., Franx, A. & Koster, M. P. H. (2022). Planning is not equivalent to preparing, how Dutch women perceive pregnancy planning in relation to preconception lifestyle behaviours: A cross-sectional study. *BMC Pregnancy Childbirth*, 22, 577. <https://doi.org/10.1186/s12884-022-04843-4>**

The objective of this Dutch study was to explore the associations between preconception behaviours, health beliefs, and pregnancy planning. Using data from the APROPOS-II study, $n = 1,077$ pregnant women were included in the study. Of the participants, 85.5% of women had planned a pregnancy and 50.5% of women had consumed alcohol at any point during their pregnancy. Women with planned pregnancies less often consumed alcohol at any point during their pregnancy and were more likely to seek preconception care health information or access health services. Preconception alcohol and tobacco use was associated with the belief that women were healthy enough and did not need preconception care. The study highlights that, even among women who were planning their pregnancy, there is still low adherence to preconception lifestyle behaviour recommendations. The findings can help inform health promotion strategies that focus on health beliefs and pregnancy planning.

24. **Marangoni, S. R., Gavioli, A., Dias, L. E., & de Oliveira, M. L. F. (2022). Consumption Of Drugs of Abuse During Pregnancy Analyzed by Means of the Opportunistic Screening Method. *Cogitare Enfermagem*, 27, 208–218. <https://doi.org/10.5380/ce.v27i0.79282>**

The aim of this study from Brazil was to document substance use screening outcomes for pregnant women receiving low-risk prenatal care and use Primary Health Care services. A total of $n = 588$ pregnant women participated and were asked about their current use of alcohol, tobacco, marijuana, and cocaine. Substance use consumption rates were assessed in 2016, 2018, and 2020 and the authors observed an increasing trend. Factors associated with risk of substance use during pregnancy were younger age, primiparous, married, not being a home owner, mid-level education level, family income of up to two minimum wages, Black or Brown skin colour, and Catholic religion. Almost half (40.8%) indicated substance use among family members. Correlations between substances used was found, indicating polysubstance use. These findings indicate the importance of brief intervention to understand women's patterns of alcohol use during pregnancy and whether they are engaged in co- or polysubstance use.

25. **May, P. A., de Vries, M. M., Marais, A. S., Kalberg, W. O., Buckley, D., Hasken, J. M., Abdul-Rahman, O., Robinson, L. K., Manning, M. A., Seedat, S., Parry, C. D. H., & Hoyme, H. E. (2022). The prevalence of fetal alcohol spectrum disorders in rural communities in South Africa: A third regional sample of child characteristics and maternal risk factors. *Alcoholism, Clinical and Experimental Research*, 46(10), 1819–1836. <https://doi.org/10.1111/acer.14922>**

This South African study examined prevalence of FASD in school-based children based on child characteristics and maternal risk factors. The prevalence of FASD was reported to be 206 – 366 per 1,000 people. FASD diagnoses were associated with co-occurring prenatal alcohol and tobacco use, maternal

drinking of two or more alcoholic drinks a day, and drinking in the first trimester, first and second trimester, and throughout pregnancy. Other risk factors include small physical status, lower BMI, less formal education, late recognition of pregnancy, and higher gravidity, parity, and older age at first pregnancy. Results indicate there is still a high prevalence of FASD in South Africa. Further interventions are needed to reduce maternal alcohol use.

26. **Muggli, E., Hearps, S., Halliday, J., Elliott, E. J., & Penington, A. (2022). A data driven approach to identify trajectories of prenatal alcohol consumption in an Australian population-based cohort of pregnant women. *Scientific reports*, 12(1), 4353. <https://doi.org/10.1038/s41598-022-08190-4>**

This Australian study leveraged data from the Asking Questions about Alcohol in Pregnancy (AQUA) longitudinal study in Melbourne to investigate the dose, frequency, and timing of alcohol use during pregnancy. Six alcohol use trajectories were identified across four timepoints in gestation: abstained (33.8%); low discontinued (trimester one)(14.4%); moderate discontinued (11.7%); low sustained (13.0%); moderate sustained (23.5%); and high sustained (3.6%). The median weekly consumption amount of absolute alcohol in trimester one ranged from 3g (classified as low discontinued) to 184g (classified as high sustained). Awareness of risk to the fetus was demonstrated by a dramatic decreased in alcohol use after pregnancy recognition across all sustained drinking trajectories. Women with moderate to high alcohol use trajectories were less likely to report that they felt the effects of alcohol quickly, were more likely to have experienced their first intoxication under the legal drinking age of 18, and more likely to have engaged in at least one binge drinking episode in the three months prior to pregnancy, compared to women in the low alcohol use trajectory. Additionally, compared to controls, women in all alcohol trajectory groups except low discontinued were two to seven times more likely to be white. There was an association between cigarette smoking and moderate to high drinking trajectories. The moderate discontinued trajectory was associated with increased likelihood of unplanned pregnancy and primiparous. The low sustained group were less likely to be primiparous. Older age and higher household income were associated with the sustained alcohol use trajectories. The authors highlight that differences in maternal characteristics across alcohol use trajectories indicate areas for targeted health promotion activities.

27. **Mulat, B., Alemnew, W. & Shitu, K. (2022). Alcohol use during pregnancy and associated factors among pregnant women in Sub-Saharan Africa: further analysis of the recent demographic and health survey data. *BMC Pregnancy Childbirth*, 22, 361. <https://doi.org/10.1186/s12884-022-04694-z>**

The aim of this study was to assess the prevalence and factors associated with alcohol use in pregnancy, among pregnant women in four Sub-Sahara African countries: Burundi, Ethiopia, Liberia, and Zimbabwe. A community-based cross-sectional demographic and health survey was conducted from 2013 to 2017 that included a weighted sample of $n = 3953$ pregnant women. The overall prevalence of alcohol use during pregnancy was 22.8% and was significantly associated with: increased age (AOR = 1.02); being Muslim (AOR = 0.07); husband/partner's educational attainment (AOR = 0.7 primary, AOR = .53 secondary, AOR = .49 higher education, respectively); currently working (AOR = 1.5); receiving antenatal care (AOR = 0.82); and increased gravidity (AOR = 0.93). Tailored interventions to reduce alcohol use during pregnancy that include an emphasis on pregnant women who have not received antenatal care, with lower gravidity, and who have partners with lower levels of literacy, who are currently working, and are Christian are needed.

28. **Ndanga, M., Sulley, S., Saka, A. K. (2022). Trend analysis of substance use disorder during pregnancy. *Cureus*, 14(3). <https://doi.org/10.7759/cureus.23548>**

This US study examined substance use trends among pregnant women. Participants with pregnancy-related diagnoses and presentation of substance use disorder indicators from the National Inpatient Sample (2015 – 2018) were included. Among the greater population, 2.7% of had primary or secondary diagnoses of a substance use disorder. Of the smaller sample ($n = 322,275$), .1% used alcohol, .9% had an opioid use disorder, 1.4% used cannabis, .1% used sedatives, and .2% used cocaine and .4% other stimulants. The results further demonstrated differences between the substance use disorder group and the control group in areas of risk

of severity at presentation and mortality, procedure type, delivery method, and cost of care. Interventions tailored to mitigating substance use during pregnancy and further assessment of the risk factors affecting these trends are needed to address short- and long-term effects of substance use during pregnancy.

29. **Page, K., Murray-Krezan, C., Leeman, L., Carmody, M., Stephen, J. M., & Bakhireva, L. N. (2022). Prevalence of marijuana use in pregnant women with concurrent opioid use disorder or alcohol use in pregnancy. *Addiction Science & Clinical Practice*, 17, 3. <https://doi.org/10.1186/s13722-021-00285-z>**

The aim of this US study was to determine the prevalence and frequency of prenatal marijuana use in women with concurrent opioid use disorder and/or alcohol use. Participants were categorized by opioid use disorder, alcohol use, or alcohol and opioid use. Prevalence of marijuana use among women with an opioid use disorder was 43.2%, 46.4% among women in the alcohol group, and 52.6% among women who used both opioids and alcohol. The number of women using marijuana was higher in those taking buprenorphine compared to those taking methadone in both the opioid and opioid and alcohol groups. When compared to non-marijuana users, maternal age was lower in those who used marijuana in all three groups. Partnership status played a significant role in all groups. Those who were not in a partnership had lower marijuana use in the opioid and opioid and alcohol groups when compared to the alcohol group. However, those in a partnership in the alcohol group had lower odds of marijuana use relative to unpartnered women. Results indicate a high prevalence of marijuana use in pregnant women who use alcohol or opioids during pregnancy highlighting the need for risk reduction strategies addressing marijuana use.

30. **Pehlke-Milde, J., Radu, I., Gouilhers, S., Hammer, R., & Meyer, Y. (2022). Women's views on moderate and low alcohol consumption: Stages of the subjective transition from pregnancy to postpartum. *BMC Pregnancy and Childbirth*, 22, 902. <https://doi.org/10.1186/s12884-022-05247-0>**

This Swiss study explored women's perceptions and experiences about alcohol use in pregnancy in order to contextualize healthcare providers' role. Forty-six women were interviewed during pregnancy and six months after birth. Authors found that participants perceived alcohol consumption as a risk to the fetus/infant and sought abstinence; however, occasional and low-level use still occurred. The results indicated five stages of transition in alcohol use and risk perception when transitioning to motherhood. However, perceptions of alcohol consumption change and that pre- and post-pregnancy were the largest time of transition. From women's perspectives, there remained a lack of counselling from health professionals and a larger need for respective and individualized counselling. There is a need for consistent and evidence-based guidance and counselling by health care professionals especially during the preconception and breastfeeding periods.

31. **Peltier, M. R., Roberts, W., Verplaetse, T. L., Burke, C., Zakiniaez, Y., Moore, K., & McKee, S. A. (2022). Licit and illicit drug use across trimesters in pregnant women endorsing past-year substance use: Results from National Survey on Drug Use and Health (2009–2019). *Archives of Women's Mental Health*, 25, 819 – 827. <https://doi.org/10.1007/s00737-022-01244-6>**

This US study examined data from the National Survey of Drug Use and Health between 2009 and 2019 to explore perinatal substance use by trimester among $n = 8,530$ pregnant women who reported past year substance use. Past month licit substance use (alcohol, tobacco) was more prevalent than illicit substance use (marijuana, cocaine, heroin, etc.); however, past year illicit use was more prevalent than past year licit use. Perinatal substance use decreased in prevalence from the first to third trimesters, with alcohol use decreasing from 26.83% in the first trimester to 6.16% in the third trimester. The decreased prevalence across the three trimesters suggests that women are discontinuing use of substances throughout trimesters, particularly licit substances and marijuana. The results imply there is a need for reliable treatment options and interventions for women who use substances while pregnant.

32. **Popova, S., Dozet, D., Akhand Laboni, S., Brower, K., & Temple, V. (2022). Why do women consume alcohol during pregnancy or while breastfeeding? *Drug and Alcohol Review*, 41(4), 759–777. <https://doi.org/10.1111/dar.13425>**

This systematic review from Canadian and UK authors examined reasons for alcohol consumption during pregnancy and while breastfeeding. Forty-two studies spanning sixteen countries were included. The most common reason for drinking during pregnancy was societal pressures and the perception that only strong and large quantities of alcohol are harmful. Other reasons for use included lack of awareness of harmful effects; coping with life stressors; belief in beneficial properties of alcohol; advice from health care professionals; unwanted or unplanned pregnancy; alcohol use disorder; and consumption as a cultural/traditional custom. Authors found the reasons for drinking while breastfeeding included: the belief alcohol stimulates milk production; unclear advice from health care professionals; lack of awareness of risks to infant; and to boost mood and celebrate events. The results indicate many reasons why a women may choose to drink while pregnant and context needs to be understood when implementing prevention and intervention strategies.

33. **Rawoot, I. A., Scott, C. J., & Urban, M. F. (2022). Barriers and facilitators of alcohol abstinence during pregnancy. *African Journal of Reproductive Health*, 26(8), 53-65. doi: 10.29063/ajrh2022/v26i8.6**

This South African study explored the alcohol use during pregnancy among eight women attending a rural antenatal clinic in the Northern Cape. Through semi-structured interviews, all women demonstrated awareness of the risks of alcohol use during pregnancy and most reported reducing their alcohol use after pregnancy recognition. The barriers to alcohol reduction included social pressure, stress from daily life, cravings, and habits. Women also identified facilitators to reducing alcohol use, which included the desire to avoid FASD, supportive relationships, and the availability of activities that do not involve alcohol. The authors suggest that efforts to support women's reduction in alcohol use during pregnancy could target the community and individual level.

34. **Sánchez, T. E., Matvienko-Sikar, K., Linehan, L., O'Donoghue, K., Byrne, M., & Meaney, S. (2022). Facilitators and barriers to substance-free pregnancies in high-income countries: A meta-synthesis of qualitative research. *Women and Birth*, 35(2), e99 – e110. <https://doi.org/10.1016/j.wombi.2021.04.010>**

This international meta-synthesis from Irish authors identified barriers and facilitators of remaining substance free during pregnancy. Twenty-two ($n = 22$) qualitative studies from high-income countries were included in analysis. The authors found internal and external barriers to continuing substance use during pregnancy. Internal barriers included perceived emotional and social benefits of using substances and feelings of shame and guilt, whereas external barriers included judgemental providers, lack of information about risks, and lack of social support. The findings demonstrated that some women concealed their use of substances due to social stigma and fear of prosecution. Facilitators to remaining substance free included awareness of health risks, intrinsic incentives, and support of family, friends, and professionals. A better understanding of the modifiable risk and protective factors can help inform future prenatal substance use prevention.

35. **Shafique, S., Umer, A., Innes, K. E., Rudisill, T. M., Fang, W., & Cottrell, L. (2022). Preconception Substance Use and Risk of Unintended Pregnancy: Pregnancy Risk Assessment Monitoring System 2016-17. *Journal of Addiction Medicine*, 16(3), 278-285. <https://doi.org/10.1097/ADM.0000000000000886>**

This US study explored the association between preconception use and unintended pregnancy among $n = 74,543$ women who had given birth between 2016 and 2017. The authors found 41% of pregnancies were unintended. 57% of participants reported alcohol consumption during the preconception period, of whom 32% reported binge drinking. 17% of participants reported smoking during preconception and 10% reported cannabis use. Unintended pregnancy was associated with substance use while the likelihood of unintended pregnancy was increased significantly with heavy smoking, heavy alcohol consumption and binge drinking.

Interventions for effective contraceptive use for those with substance use behaviours are needed to prevent unintended pregnancies and related risks to maternal and child health.

36. **Tsang, T. W., Kingsland, M., Doherty, E., Anderson, A. E., Tully, B., Crooks, K., Symonds, I., Tremain, D., Dunlop, A. J., Wiggers, J., & Elliott, E. J. (2022). Predictors of alcohol use during pregnancy in Australian women. *Drug and Alcohol Review*, 41(1), 171–181. <https://doi.org/10.1111/dar.13330>**

This Australian study examined the prevalence of alcohol use during pregnancy, predictors of ongoing use, and knowledge of and agreement with national alcohol guideline recommendations. Pregnant women ($n = 1,179$) attending public antenatal services in New South Wales were surveyed about their alcohol use pre-pregnancy and after pregnancy recognition, and their knowledge and agreement with national alcohol guidelines. 79.3% of participants consumed alcohol before pregnancy, but 82% stopped drinking after pregnancy recognition. Most participants knew of the national guidelines and the recommendation that no amount of alcohol is safest; however, 4.6% thought some alcohol was safe and 17.3% were unsure. More high-risk drinkers pre-pregnancy were unaware of the guidelines. Women who were unable to correctly relay the recommendations were more frequently younger, with lower levels of education. Predictors of ongoing drinking were older age, medium and high-risk drinking pre-pregnancy, and disagreement with health-related statements (i.e., that avoiding alcohol use in pregnancy is safest). The results highlight the link between pre-pregnancy and ongoing drinking. Further, they highlight the need to further explore why some disagree with the national guidance, and that interventions integrating health information/education are critical.

37. **Wolfson, L., Poole, N., Harding, K. D., & Stinson, J. (2022). At a Juncture: Exploring Patterns and Trends in FASD Prevention Research from 2015 – 2021 Using the Four-Part Model of Prevention. *Journal of Fetal Alcohol Spectrum Disorder*, 4(SP1), e36–e59. <https://doi.org/10.22374/jfasd.v4iSP1.13>**

The aim of this review from Canadian authors was to describe the state of FASD prevention research from 2015 – 2021. Using thematic analysis, the identified articles were organized by prevalence and influences on alcohol use during pregnancy, the four levels of prevention, and systemic, destigmatizing, and ethical considerations. From 2015 – 2020, $n = 532$ articles were identified. The literature largely focused on the prevalence and influences of alcohol use during pregnancy (34.2%) and level 2 prevention efforts (32.7%). Attention to multi-service, trauma-informed, relational, and holistic approaches to supporting women and their children increased. Further research is required to address stigma, as a barrier to care across each of the levels of FASD prevention.

38. **Young-Wolff, K. C., Slama, N., Sarovar, V., Conway, A., Tucker, L. Y., Goler, N., Terplan, M., Ansley, D., Adams, S. R., Armstrong, M. E. (2022). Association of Pregnancy Intentions with Substance Use During Early Pregnancy. *Journal of addiction medicine*, 16(1), 118–121. <https://doi.org/10.1097/ADM.0000000000000825>**

This US study investigated the association between pregnancy intentions and substance use during early pregnancy. In 2018, a total of 29,787 pregnancy women (12.1% aged <25, 36.4% non-Hispanic White) in Northern California were screened for prenatal substance use using self-report and urine toxicology tests at approximately eight weeks gestation. Unintended pregnancy was reported by 23.9% of the sample and was associated with higher odds of any prenatal substance use compared to women with an intended pregnancy (28.8% vs. 16.1%). Specifically, unintended pregnancy was associated with higher odds of alcohol (14.4% vs. 10.4%), cannabis (15.6% vs. 5.6%), nicotine (3.8% vs. 1.3%), pain medication (2.3% vs. 1.2%), and simulant use (0.8% vs. 0.3%), respectively, in early pregnancy compared to intended pregnancy. The authors highlight that health education about contraception with women of reproductive age and early screening for prenatal substance use is important to reduce the prevalence and harms of substance use during pregnancy.

B. Level 1 Prevention

1. **Heenan, M., Shanthosh, J., Cullerton, K., & Jan, S. (2022). Influencing and implementing mandatory alcohol pregnancy warning labels in Australia and New Zealand. *Health Promotion International*. <https://doi.org/10.1093/heapro/daac022>**

This Australian study discussed the implementation of pregnancy warning labels on alcohol products in Australia and New Zealand. The authors described challenges and barriers to policy change and how those were addressed through building the evidence, health advocacy efforts, countering industry conflicts of interest, testing messages with consumers, and mobilizing community and political support. In their reflections for other countries looking to create policy change, the authors highlight the importance of building relationships with decision makers and regularly updating them with evidence and evidence-informed recommendations, shared lived-experience, and industry strategies and tactics.

2. **Jacobsen, B., Lindemann, C., Petzina, R., & Verthein, U. (2022). The universal and primary prevention of Foetal Alcohol Spectrum Disorders (FASD): A systematic review. *Journal of Prevention*, 43(3), 297-316. <https://doi.org/10.1007/s10935-021-00658-9>**

This systematic review from Germany gathered studies on FASD prevention and assessed FASD prevention strategies' effectiveness in preventing FASD. A search of English and German articles from Europe, North America, and Australia was conducted in five databases. A total of $n = 10$ articles were included in the review. FASD prevention strategies included alcohol warning labels, awareness posters, multi-level programming, motivational interviewing, and educational workshops on screening and brief interventions for healthcare providers. Efficacy was assessed through outcome measures related to FASD awareness, knowledge, self-efficacy, and behaviour change. The findings suggest that the approaches included in the systematic review can be effective in preventing FASD. However, further research is needed to explore behavioural changes resulting from the implementation of FASD prevention strategies.

3. **Lacoste-Badie, S., Droulers, O., Dossou, G., & Gallopel-Morvan, K. (2022). Improving the effectiveness of pregnancy warning labels displayed on alcohol containers: a French eye-tracking study. *Public Health*, 212, 22-27. <https://doi.org/10.1016/j.puhe.2022.08.010>**

The aim of this within-subject experiment from France was to assess the influence of pregnancy warning label (PWL) design using an eye-tracking method to determine women's visual attention and alcohol product choice. Women of childbearing age ($n = 99$) observed 48 wine bottles. Women did not pay attention to the PWL design used at the time of study in France. Larger, more colourful pregnancy warning labels with a pictogram in addition to text attracted more attention and were less frequently chosen by women. The authors recommend updating PWL design in France to increase its effectiveness.

4. **Lemon, D., Swan-Castine, J., Connor, E., van Dooren, F., Pauli, J., Boffa, J., Fitzpatrick, J., & Pedruzzi, R. A. (2022). Vision, future, cycle and effect: A community life course approach to prevent prenatal alcohol exposure in central Australia. *Health promotion Journal of Australia*, 33(3), 788-796. <https://doi.org/10.1002/hpja.547>**

This Australian study evaluated a health promotion initiative aimed at preventing prenatal alcohol exposure (PAE) and FASD among an Aboriginal and Torres Strait Islander community. Health promotion staff co-developed a series of television commercial scripts that were piloted with 35 community members. Two overarching themes were identified in participant responses – Strength and Community Resonance. Participants responded positively to script elements that focused on intergenerational influences on PAE. Following the pilot, a four-part television and radio campaign to prevent PAE was developed, encompassing a life course approach and themes of "Vision," "Future," "Cycle" and "Effect." The authors highlight the importance of developing prevention initiatives that are culturally responsive and focus on collective responsibility and community action.

5. **Maas, V. Y. F., Poels, M., Ista, E., Menge, L. F., Vanden Auweele, K. L. H. E., de Bie, R. W. A., de Smit, D. J., van Vliet-Lachotzki, H., Franx, A., & Koster, M. P. H. (2022). The effect of a locally tailored intervention on the uptake of preconception care in the Netherlands: a stepped-wedge cluster randomized trial (APROPoS-II study). *BMC Public Health*, 22(1), 1997. <https://doi.org/10.1186/s12889-022-1434-x>**

This randomized controlled trial aimed to assess the effectiveness of a locally tailored preconception care (PCC) intervention in four Dutch municipalities in the Netherlands. The intervention involved a social marketing strategy focused on improving the uptake of PPC by prospective parents and the provision of PCC by healthcare providers. There were $n = 213$ women and $n = 39$ men in the intervention condition and $n = 850$ women and $n = 154$ men in the control condition. In the municipality where the intervention had the most reach, women's adherence to preconception lifestyle recommendations (early initiation of folic acid supplements, healthy nutrition, no smoking or alcohol use) were significantly improved. Additionally, healthcare providers awareness of PCC risk factors was improved as was their confidence in starting conversations about preconception health. This study demonstrates the effectiveness of tailored and locally relevant PCC interventions to improve the health of prospective parents as well as the competence of healthcare providers in delivering PCC.

6. **McQuire, C., Zuccolo, L., Frennesson, F., Butcher, S., Carel, H., Cook, P., Dvorak, T., Gilham, E., Hurt, L., Langford, R., Misell, A., Mukherjee, R., Porter, A., Susoy, O., Taylor-Robinson, D., Troy, D., & de Vocht, F. (2022). Prenatal alcohol prevention in the UK: mapping the landscape through systematic collaborative review. *Lancet*, 400 Suppl 1, S64. [https://doi.org/10.1016/S0140-6736\(22\)02274-7](https://doi.org/10.1016/S0140-6736(22)02274-7)**

This systematic collaborative review aimed to assess the content, process, and effectiveness of prenatal alcohol exposure (PAE) prevention initiatives in the UK. Evidence was gathered through a systematic search of published and grey literature; consultations with 61 stakeholders in academia, practice, policy, third sector, and the public; and 12 semi-structured interviews with pregnant people and service providers representing each region in the UK. A total of 14 PAE prevention initiatives were identified, including screening and intervention, campaigns, and education or training. Seven initiatives were identified in the north of England; two in Scotland; two in Wales; one each in the East of England, West Midlands, and Southwest of England; and none in Southwest of England or Northern Ireland. Among barriers to prevention were a lack of resources, excessive workloads, concerns around blame, and the COVID-19 pandemic. Trust between pregnant people and service providers emerged as a facilitator of prevention initiatives, as well as workforce training. There is a lack of evidence on the effectiveness of initiatives. Data collection and analyses were ongoing at the time of publishing.

7. **Millot, A., Serra, M., & Gallopel-Morvan, K. (2022). How the alcohol industry fought against pregnancy warning labels in France. A press coverage analysis spanning 20 years. *Frontiers in Public Health*, 10, 933164. <https://doi.org/10.3389/fpubh.2022.933164>**

This French study analyzed the arguments made by the alcohol industry (producers, distributors, wholesalers, allied industries, trade associations, social aspects and public relations organizations, councillors who publicly defend wine-sector interests) used in the press between 2000 and 2020. There were $n = 85$ articles from the mainstream press included. Peaks in the number of articles published coincided with pregnancy warning label implementation in 2007 and a proposed expansion in 2018 that was ultimately not adopted. Very few arguments made by the alcohol industry were in favour of pregnancy warning labels. The alcohol industry questioned the effectiveness of pregnancy warnings, argued that warnings would be counterproductive to women and the wider economy, and claimed that better alternatives exist (such as targeted prevention programs and healthcare professional delivery of prevention activities). Most industry representatives in the press were from the winegrowing sector. Considering lobbyist arguments, the authors offered five public health recommendations, often borrowing from lessons learned in tackling the tobacco industry: (1) international collaboration on alcohol warnings labels and protection of alcohol policies, (2) increased transparency of alcohol industry interference in government, (3) additional research on the

effectiveness of alcohol warning labels and their details to counter arguments of their ineffectiveness and research on the economic impacts of alcohol on society, (4) providing public health stakeholders with lobbying and media skills, and (5) denouncing the alcohol industry's marketing and lobbying strategies through counter-marketing campaigns.

8. **Okulicz-Kozaryn, K. (2022). Is Public Health Response to the Phenomenon of Alcohol Use during Pregnancy Adequate to the Polish Women's Needs? *International Journal of Environmental Research and Public Health*, 19(8), 4552. <https://doi.org/10.3390/ijerph19084552>**

The aim of this Polish paper was to analyze best practices and examples of public health campaigns to reduce alcohol use during pregnancy to improve the quality and effectiveness of social campaigns in Poland. The analysis highlights that more research is needed to understand why Polish women continue to use alcohol during pregnancy, as are communication strategies for reaching the general population and women of childbearing age.

9. **Pettigrew, S., Booth, L., McCausland, T., Kennington, K., Miller, M., Bowden, J., & Stafford, J. (2022). Evaluation outcomes of an alcohol and pregnancy campaign targeting multiple audiences. *Drug and Alcohol Review*. <https://doi.org/10.1111/dar.13541>**

This study evaluated the effectiveness of a media campaign to increase awareness of the potential harms of alcohol use during pregnancy in Western Australia. A total of $n = 889$ adults were surveyed to assess alcohol use, recognition and perceptions of the campaign, and behavioural changes associated with exposure to the campaign. Most respondents (71%) reported exposure to the campaign. There was a positive response to the campaign, with respondents finding it to be believable (89%), clear (88%), trustworthy (87%), memorable (82%), and among the best they had seen (78%), and 85% reported an increased concern about alcohol use during pregnancy after exposure to the campaign. Most female respondents (83%) reported a decreased likelihood of drinking during pregnancy and one-third of female respondents (33%) reported making the decision to not drink while pregnant after exposure to the campaign. Having the confidence to abstain and being aware of abstinence strategies were among factors that were associated with greater perceived campaign effectiveness. The authors conclude that well-designed mass media campaigns can be perceived as effective and acceptable, and can increase women's intentions to not use alcohol while pregnant.

10. **Schölin, L. & Heenan, M. (2022). No Alcohol, No Risk. #FASD"- Twitter Activity on Alcohol and Pregnancy among Australian Organizations". *Substance Use & Misuse*, 57(14), 2021-2030. <https://doi.org/10.1080/10826084.2022.2083170>**

This study investigated how Australian organizations and stakeholders communicated the health risks associated with alcohol use during pregnancy on Twitter. Seventeen relevant organizations were found to have tweeted about alcohol, pregnancy, and FASD between 2010 and 2019. A content analysis was conducted and themes across 347 tweets were identified. The organizations were primarily public health and disability nongovernmental organizations. Most tweets focused on FASD. Less frequently, tweets mentioned other potential consequences of alcohol use during pregnancy, offered direct advice, or mentioned official guidelines. Ongoing policy debates in Australia were reflected in the tweets, including mentions of alcohol warning labels and disability policy. The authors highlight that there is an opportunity for more communication of trusted national health guidance, including consistent communication about alcohol use during pregnancy.

11. **Tsang, T. W., Kingsland, M., Doherty, E., Anderson, A. E., & Tully, B., Ward, S., Wiggers, J., & Elliot, E. J. (2022). Written information and health professionals are the information sources about alcohol use in pregnancy most often used by pregnant women. *Drug and Alcohol Review*, 41(7), 1599-1609. <https://doi.org/10.1111/dar.13512>**

This Australian study investigated where pregnant women access information about alcohol use during pregnancy, with a focus on associations between information sources and women's demographic

characteristics and alcohol use behaviours during pregnancy. Among $n = 4511$ pregnant women who were surveyed, 80.1% used at least one source of information. The sources most often reported were written/electronic information (45.4%), health providers (37.6%), and family/friends (19.5%). Characteristics associated with higher use of these three information sources were first pregnancy, younger age, and higher educational attainment. Receiving information from written/electronic sources was associated with a higher likelihood of reporting alcohol use during pregnancy. Almost 20% of women did not receive information about alcohol use during pregnancy, and these women tended to be older, multiparous, and highly educated. The authors recommend that antenatal providers consistently and routinely provide all women with information about alcohol use in pregnancy.

12. **Wolfson, L., Poole, N., Harding, K. D., & Stinson, J. At a Juncture: Exploring Patterns and Trends in FASD Prevention Research from 2015 – 2021 Using the Four-Part Model of Prevention. *Journal of Fetal Alcohol Spectrum Disorder*, 4(SP1), e36–e59. <https://doi.org/10.22374/jfasd.v4iSP1.13>**

See above (Prevalence of, and influences and factors associated with, alcohol use in pregnancy).

C. Level 2 Prevention

1. **Agiresaasi, A., Nassanga, G., Maina, G. W., Kiguli, J., Nabiwemba, E., Kiwanuka, N., Mukose, A., & Tumwesigye, M. M. (2022). Effect of a communication intervention on alcohol use during pregnancy in post conflict Northern Uganda: A quasi experimental study. *Substance Abuse Treatment, Prevention, and Policy*, 17(1), 80. <https://doi.org/10.1186/s13011-022-00505-y>**

The aim of this Ugandan study was to assess the effect of a communication campaign on alcohol use during pregnancy in post conflict northern Uganda. A community health worker delivered the communication strategy to $n = 420$ women of reproductive age. The communication strategy focused on knowledge, attitudes, and patterns of alcohol use during pregnancy. The messages were significantly associated with reduced odds of binge drinking, less frequent drinking, and less harmful alcohol use. There was also an increase in knowledge about alcohol use during pregnancy and in positive attitudes, although these findings were not statistically significant. These findings contribute to the evidence base on the effectiveness of brief interventions to reduce alcohol use during pregnancy and demonstrate the importance of addressing the influencing factors of women's drinking.

2. **Arkell, R., & Lee, E. (2022). Using meconium to establish prenatal alcohol exposure in the UK: Ethical, legal, and social considerations. *Journal of Medical Ethics*, 0, 1 – 5. <https://doi.org/10.1136/jme-2022-108170>**

This UK commentary explored the use of biomarkers as a screening tool for prenatal alcohol exposure. The authors argue that routine screening of meconium to establish prenatal alcohol exposure cannot be legally or ethically justified. Further considerations on ethical, legal, and social considerations and the relationship between healthcare providers and patients in maternity care is encouraged.

3. **Bennett, R. & Bowden, C. (2022). Can routine screening for alcohol consumption in pregnancy be ethically and legally justified? *Journal of Medical Ethics*, 48(8), 512–516. <https://doi.org/10.1136/medethics-2021-107996>**

This editorial from the UK argued against proposed increases in screening pregnant women for alcohol use in pregnancy using blood biomarkers and meconium testing. Citing a lack of evidence that increases in this kind of screening reduces harms to the fetus, the authors discuss the implications to women's autonomy, trust with healthcare professionals, and legal right to informed consent.

4. **Ceci, F. M., Fiore, M., Agostinelli, E., Tahara, T., Greco, A., Ralli, M., Polimeni, A., Lucarelli, M., Colletti, R., Angeloni, A., Tirassa, P., Ceccanti, M., Messina, M., P., Vitali, M., Petrella, C. & Ferraguti,**

G. (2022). Urinary ethyl glucuronide for the assessment of alcohol consumption during pregnancy: Comparison between biochemical data and screening questionnaires. *Current Medicinal Chemistry*, 29(17), 3125. <https://doi.org/10.2174/092986732866621125100329>

The aim of this Italian study was to compare ethyl glucuronide (EtG), an ethanol metabolite used as an alcohol marker), with a daily food diary. Urine samples were collected from $n = 309$ women. One fifth of women (20.4%) of pregnant women were above the established cut-off value and there was poor to null concordance between EtG and screening interviews, which reported lower levels of alcohol use. The findings suggest that food diaries may be misleading in reporting accurate alcohol use during pregnancy.

5. **Chanal, C., Mazurier, E., & Doray, B. (2022). Use of psychoactive substances during the perinatal period: guidelines for interventions during the perinatal period from the French National College of Midwives. *Journal Of Midwifery & Women's Health*, 67 Suppl 1, S17-S37. <https://doi.org/10.1111/jmwh.13419>**

These guidelines from France provide recommendations to support pregnant women during the perinatal period. The guidelines include the prevalence of psychoactive substance use (alcohol, cannabis, cocaine, amphetamines, and opioids) in the pregnancy, postpartum and breastfeeding periods, and maternal, fetal, newborn, and child health effects. The guidelines recommend asking simple, non-judgemental questions to help increase patient confidence and competence before using a screening tool. Situational management and approaches based on differing levels of use are included. Providers are advised to discuss substance use at pregnancy confirmation and at each subsequent appointment.

6. **Doherty, E., Kingsland, M., Elliott, E.J., Tully, B., Wolfenden, L., Dunlop, A., Symonds, I., Attia, J., Ward, S., Hunter, M., Azzopardi, C., Rissel, C., Gillham, K., Tsang, T.W., Reeves, P., & Wiggers, J. (2022). Practice change intervention to improve antenatal care addressing alcohol consumption during pregnancy: a randomised stepped-wedge controlled trial. *BMC Pregnancy Childbirth*, 22(1):345. <https://doi.org/10.1186/s12884-022-04646-7>**

The objective of this Australian randomized stepped-wedge controlled trial was to estimate the effectiveness of an antenatal care intervention to address alcohol use during pregnancy. The trial was conducted in three public maternity sectors. Pregnant women ($n = 5,694$) completed interviews and questionnaires. The intervention was effective in increasing women's receipt of screening, discussion of potential risks and advice around alcohol use during pregnancy. The effects of the intervention were greater at 27 – 28 weeks and 35 – 36 weeks gestation compared to the initial antenatal visit. No differences by sector were reported. Future research should explore demographic differences in the receipt and efficacy of the intervention.

7. **Dray, J., Licata, M., Doherty, E., Tully, B., Williams, B., Curtin, S., White, D., Lecathelinais, C., Ward, S., Hasson, S., Elliott, E. J., Wiggers, J., & Kingsland, M. (2022). Enhancing clinician participation in quality improvement training: implementation and impact of an evidence-based initiative to maximise antenatal clinician participation in training regarding women's alcohol consumption during pregnancy. *BMC Health Services Research*, 22(1), 402. <https://doi.org/10.1186/s12913-022-07717-9>**

This clinical trial from Australia assessed the extent of antenatal clinicians' participation in evidence-based training to how address alcohol use during pregnancy is assessed, including differences in participation based on profession. A training initiative based on six evidence-based principles was implemented in a maternity service over a 7-month period. It was found that 98% of antenatal clinicians participated in some training, 69% participated in at least one hour of training, but only 7% participated in training that covered all six principles. Significantly more midwifery professionals completed five of the six training principles compared to medical clinicians. The authors conclude that tailored training for different professions could improve clinician capacity to delivery evidence-based care.

8. **Everitt, L., Stulz, V., Elmir, R., & Schmied, V. (2022). Educational programs and teaching strategies for health professionals responding to women with complex perinatal mental health and psychosocial concerns: A scoping review. *Nurse Education in Practice*, 60, 103319. <https://doi.org/10.1016/j.nepr.2022.103319>**

In this scoping review from Australia, authors summarized educational and teaching strategies for confidence and skill building for health professionals and students to address complex psychosocial concerns experienced in the perinatal period. Specifically, innovations related to increasing competence in addressing perinatal mental health, experiences of violence, and drug and alcohol misuse were identified. The review included $n = 34$ papers published between 2009 and 2020. A diverse range of initiatives were found, which included face-to-face, online, and blended models. Virtual learning options provided new and innovative opportunities for learning about this sensitive topic. The incorporation of perspectives from individuals with lived/living experience, opportunities for practice, interprofessional learning, and teamwork were identified by health professionals as valuable and beneficial to their learning. The authors conclude that the design and delivery of education programs should involve individuals with lived/living experience to facilitate nurses, midwives, and other health professionals and students' learning regarding complex psychosocial topics in the perinatal period.

9. **Jimenez, P. V., Lichtenberger, A., Cremonte, M., Cherpitel, C. J., Peltzer, R. I., & Conde, K. (2022). Efficacy of Brief Intervention for Alcohol Consumption during Pregnancy in Argentinean Women: A Randomized Controlled Trial. *Substance Use & Misuse*, 57(5), 674-683. doi: <https://doi.org/10.1080/10826084.2022.2026967>**

This study assessed the efficacy of a brief intervention (BI) to reduce alcohol use among pregnant women in Argentina. A total of $n = 486$ women who were less than 26 weeks gestation were randomly selected to receive either brief advice (BA) or BI, $n = 154$ women who were more than 26 weeks gestation served as the screening only control group (SC), and $n = 150$ women were randomly selected to a non-screening control group (NSC). Self-reported alcohol use and alcohol-related problems were assessed at three months post screening, and newborn health records were examined. BI and BA were found to significantly reduce alcohol consumption compared to SC. Compared to the NSC group, newborns of the women in the BI and BA groups had better health outcomes. The authors highlight that while BI has been shown to be effective among pregnant women from high-income countries, this study demonstrates the efficacy of BI and BA in South America.

10. **Hanson, J. D., Oziel, K., Harris, A., Sarche, M., O'Leary, M., et al. (2022). Adaptations of an RCT during COVID: Case Study in one Rural American Indian Community. *Collaborations*, 5(1), 2. <https://doi.org/10.33596/coll.86>**

This brief report outlined the process of adapting a randomized controlled trial of Project CHOICES project during tribally-enacted COVID-19 restrictions. Project CHOICES includes in-person motivational interviewing sessions. The study team worked with the Community Advisory Board and community-based staff to establish adaptations to the intervention. The authors provide recommendations for public health programs based on this experience and discuss access considerations in resource-poor and underserved settings. The authors highlight the importance of prioritizing tribal sovereignty in decision-making around research activities, both during the COVID-19 emergency and as in-person activities restart.

11. **Hen-Herbst, L., El Levin, M. R., Senecky, Y., Frishman, S. & Berger, A. (2022). Nutritionists' practices and knowledge about the risks of alcohol consumption during pregnancy: An Israeli survey. *Nutrients*, 14(9), 1885. <https://doi.org/10.3390/nu14091885>**

This Israeli study assessed nutritionists' knowledge of the risks of alcohol use during pregnancy, their professional practices related to alcohol and pregnancy, and their ability to assess and provide guidance around alcohol use during pregnancy. Professional nutritionists ($n = 526$) completed an anonymous online questionnaire. The majority of nutritionists (66.5%) agreed that they did not have enough knowledge to

provide guidance around alcohol use to pregnant women. However, nutritionists' experience, self-perceived competence, and mean knowledge scores were related to the variance in professional practices. Nutritionists and other allied health professionals can play a role in preventing FASD.

12. **Hwang, C.-L., Phillips, S. A., Tu, M.-H., & Piano, M. R. (2022). Time to promote the awareness of unhealthy alcohol use among women. *Journal of Women's Health, 31*(1), 1 – 3. <http://doi.org/10.1089/jwh.2021.0546>**

This editorial from US authors describes the increase in alcohol use among women and reasons for use, including to cope. The authors note the assumption that women do not drink heavily, the tendency not to screen women's alcohol use, and thus the importance of raising awareness of alcohol use among women.

13. **Jacobsen, B., Lindemann, C., Petzina, R., & Verthein, U. (2022). The universal and primary prevention of Foetal Alcohol Spectrum Disorders (FASD): A systematic review. *Journal of Prevention, 43*(3), 297-316. <https://doi.org/10.1007/s10935-021-00658-9>**

See above (Level 1).

14. **Maas, V. Y. F., Poels, M., Ista, E., Menge, L. F., Vanden Auweele, K. L. H. E., de Bie, R. W. A., de Smit, D. J., van Vliet-Lachotzki, H., Franx, A., & Koster, M. P. H. (2022). The effect of a locally tailored intervention on the uptake of preconception care in the Netherlands: a stepped-wedge cluster randomized trial (APROPOS-II study). *BMC Public Health, 22*(1), 1997. <https://doi.org/10.1186/s12889-022-1434-x>**

See above (Level 1).

15. **Marcellus, L., Cleveland, L., Maguire, D., Blythe, S., Goodman, D., et al. (2022). Developments in Nursing Practice to Address Substance Use in the Perinatal Period. *Journal of obstetric, gynecologic, and neonatal nursing, 51*(4), 361-376. <https://doi.org/10.1016/j.jogn.2022.03.004>**

This commentary from Canadian, US, and Australian authors provides a historical look at the trends, sociolegal implications, and nursing practice and research related to women with substance use disorders over the past 50 years. The authors provide recommendations and priority areas for practice and research across substance use and mental health, perinatal and neonatal care, and policy and legislation. Recommendations and priorities included: implementation of gender-, trauma-, and harm-reduction-informed approaches to screening and treatment; brief intervention; support for the mother-infant dyad; cross-sectoral collaboration; and equity- and gender-informed practice and policy.

16. **McQuire, C., Zuccolo, L., Frennesson, F., Butcher, S., Carel, H., Cook, P., Dvorak, T., Gilham, E., Hurt, L., Langford, R., Misell, A., Mukherjee, R., Porter, A., Susoy, O., Taylor-Robinson, D., Troy, D., & de Vocht, F. (2022). Prenatal alcohol prevention in the UK: mapping the landscape through systematic collaborative review. *Lancet, 400* Suppl 1, S64. [https://doi.org/10.1016/S0140-6736\(22\)02274-7](https://doi.org/10.1016/S0140-6736(22)02274-7)**

See above (Level 1).

17. **Montanaro, C., Robson, L., Binnington, L., Winters, N., & Brown, H. K. (2022). Validating PreCHAT: A Digital Preconception Health Risk Assessment Tool to Improve Reproductive, Maternal and Child Health. *The Canadian journal of nursing research = Revue canadienne de recherche en sciences infirmieres, 55*(2), 206-215. <https://doi.org/10.1177/08445621221112668>**

This study from Canada validated the Preconception Health Assessment Tool (PreCHAT), a digital preconception risk assessment tool. PreCHAT is designed to screen individuals in the reproductive years for health and pregnancy risk factors. Patients are sent a link to the website prior to an appointment with their

primary care physicians. The results are then uploaded to patients' electronic medical record (EMR) and an individualized handout is produced to increase awareness, and with the support of their primary care physician, prevent, modify, and manage risks to patients' health and future pregnancies. This criterion validation study was conducted with $n = 53$ female participants (ages 18 – 44) and identified 135 risk factors (compared to 102 using a best practice tool). The findings demonstrate that PreCHAT is a valid against the current best practice tool and is broader in its risk identification among individuals in the preconception period. PreCHAT may offer more unique benefits to patients and providers alike, as a patient-facing, online, and EMR-integrated tool.

18. **Morrello, R., Cook, P. A., & Coffey, M. (2022). "Now, with a bit more knowledge, I understand why I'm asking those questions." Midwives' perspectives on their role in the Greater Manchester health and social care partnership's programme to reduce alcohol exposed pregnancies. *Midwifery*, 110, 103335. <https://doi.org/10.1016/j.midw.2022.103335>**

The aim of this UK qualitative study was to understand midwives' perspectives on the impact of a health and social care partnership program and activities geared towards midwives, including new screening protocols and referral pathway. Six midwives were interviewed. The midwives described their use of the validated screening tool during multiple antenatal appointments and their confidence in discussing alcohol. Participants expressed the importance of discussing alcohol and thus how the introduced activities were in alignment with the midwifery model of care. Further training on screening and brief intervention may help improve the efficacy of the program.

19. **Oh, S. S., Moon, J. Y., Chon, D., Mita, C., Lawrence, J. A., Park, E-C., Kawachi, I. (2022). Effectiveness of Digital Interventions for Preventing Alcohol Consumption in Pregnancy: Systematic Review and Meta-analysis. *Journal of medical Internet research*, 24(4), e35554. <https://doi.org/10.2196/35554>**

This systematic review and meta-analysis from Korean authors assessed the effectiveness of digital interventions to prevent alcohol use during pregnancy and the pregnancy-planning period, and to investigate whether different digital platforms (i.e., computers, mobile phones, and text messaging services) have differing levels of effectiveness. The final review included $n = 6$ studies and found that, compared to controls, digital interventions decreased the risk of alcohol use during pregnancy. Computer/internet-based interventions were found to be an effective platform for intervention delivery. More research is needed to understand the effectiveness of text messaging interventions. The authors discuss the advantages of digital interventions to promote healthy behavioural changes and engagement in interventions, and conclude that they are an effective tool for preventing alcohol use among pregnant women and women planning a pregnancy.

20. **Olusanya, O. A., Greene, K. M., Rossheim, M. E. & Berry, A. E. (2022). Midwives' knowledge and perceived barriers to screening alcohol use among pregnant women in a southwestern US state. *Drug and Alcohol Review*, 42, 384 – 388. <https://doi.org/10.1111/dar.13576>**

This US study examined midwives' knowledge, attitudes, and intentions to screen for prenatal alcohol use and assess their perceived barriers to communicating information about perinatal alcohol use. Data were collected via questionnaire from midwives in a southwestern US state. A fifth (20.3%) of midwives considered one alcoholic drink per occasion to be safe for the fetus, 14.8% believed alcohol was safe during the third trimester, and a few thought it was safe in all trimesters. The majority (63.3%) of midwives were unaware that the TWEAK and T-ACE were validated screening tools for pregnant women. More than half of midwives agreed that limited appointment times, the need for additional training, and lack of referral information impacted their ability to share guidance. Further research is required to explore additional barriers that impact midwives' ability to share guidance and use validated alcohol screening tools.

21. **Oni, H. T., Drake, J. A., Dietze, P., Higgs, P., & Islam, M. M. (2022). Barriers to women's disclosure of and treatment for substance use during pregnancy: A qualitative study. *Women and Birth, 35*(6), 576-581. <https://doi.org/10.1016/j.wombi.2021.12.009>**

This qualitative study from Australia explored the barriers to disclosing substance use during pregnancy and accessing substance use treatment. One-on-one semi-structured interviews were conducted with 15 women. A main barrier to disclosing substance use and receiving treatment was the fear of losing child custody and involvement with child protection services. Women also reported stigma and a perception of limited treatment options as barriers. The authors highlight that pregnancy provides an opportunity for service providers to engage with and support women regarding substance use, and that tailored interventions are important for successful engagement with treatment.

22. **Perkes, S. J., Huntriss, B., Skinner, N., Leece, B., Dobson, R., Mattes, J., Hall, K., & Bonevski, B. (2022). Development of a Maternal and Child mHealth Intervention with Aboriginal and Torres Strait Islander Mothers: Co-design Approach. *JMIR formative research, 6*(7), e33541. <https://doi.org/10.2196/22541>**

This Australian study aimed to co-design a culturally safe mobile health (mHealth) intervention for women caring for Aboriginal and Torres Strait Islander children in order to improve health knowledge, behaviours, and access to health services. Aboriginal researchers and an app developer facilitated 8 focus groups and 12 interviews with 31 mothers and 11 health professionals to inform an intervention prototype. Six design characteristics were identified as important: credibility, Aboriginal and Torres Strait Islander designs and cultural safety, family centeredness, supportive, simple to use, and confidential. Components of the intervention were informed by theories of health behaviour change. There were 6 modules for women's health (Smoke-free families, Safe drinking, Feeling good, Women's business, Eating, and Exercising) and 6 modules for children's health (Breathing well; Sleeping; Milestones; Feeding and eating; Vaccinations and medicines; and Ears, eyes, and teeth) included. Finally, 6 features related to technology features and functions were identified: content feed, social connection, reminders, rewards, communication with health professionals, and use of videos. Resulting for the co-design process, the intervention prototype included an app, Facebook page, and SMS text messaging system. The intervention prototype needs to be investigated in a pilot study to assess the acceptability and feasibility of the intervention. The authors highlight that culturally safe and evidence-based mHealth interventions are needed for Aboriginal and Torres Strait Islander people in Australia.

23. **Renbarger, K.M., Trainor, K.E., Place, J.M., & Broadstreet, A. (2022). Provider Characteristics Associated with Trust When Caring for Women Experiencing Substance Use Disorders in the Perinatal Period. *Journal of Midwifery & Women's Health, 67*, 75-94. <https://doi.org/10.1111/jmwh.13320>**

This systematic review from US authors explored provider characteristics associated with the development of trust among women with substance use disorders (SUDs) in the perinatal period. A search of qualitative research from Canada and the US that described positive health care interactions between women and providers, from the perspective of women, was conducted. Twenty-one qualitative studies were identified. Three overarching themes were identified including providers 1) approvingly viewing women experiencing perinatal SUD and approaching them in a caring manner; 2) affirming women's efforts; and 3) delivering informed and competent care. Seven descriptive subthemes were described including: developing rapport with women, demonstrating caring behaviours, including women in care, understanding women's treatment efforts, reassuring women, delivering competent care, and educating women. The findings highlight the importance of integrated, trauma-informed, stigma-free, and women-centered care.

24. **Sapru, S., Green, P., Weber, M. K., Chansky, M., & Price, S. (2022). Evaluating Partnerships for Practice Change in the Prevention, Identification, and Treatment of Fetal Alcohol Spectrum Disorders. *Journal of Addiction & Addictive Disorders, 9*(1), 1-5. <https://doi.org/10.24966/AAD-7276/100077>**

This US study evaluated a four-year partnership initiative funded by the Centers for Disease Control and Prevention that involved university and health care professional associations (HCPAs) in implementing evidence-based approaches to FASD prevention, identification, and treatment across six health disciplines. Quantitative and qualitative data was leveraged from quarterly progress reports, a semi-annual collaboration survey, and annual interviews with members from each health discipline to evaluate (1) structure and formation, (2) collaboration process, and (3) resources and strategies developed. Through the evaluation, it was found that the development and dissemination of resources was challenged by the limited involvement of researcher expertise in some assigned partnerships and limited ability of HCPAs to reach priority audiences. Two partnerships had challenges related to collaboration. A promising approach was the involvement of provider champions to disseminate resources and engage HCPs. The authors conclude that partnerships between researchers and HCPs can be either challenged or facilitated depending on the circumstance of their formation, and recommend discipline-specific partnerships for wider adoption of evidence-based resources and practice.

25. **Silverio, S. A., Karki, P., Lakhani, S., Alter, M., Weinman, J., & Flynn, A. C. (2022). 'People still want a face and that's where we can fill in': A qualitative study of community pharmacists' experiences of providing healthcare advice about preconception and pregnancy. *International Journal of Pharmacy Practice*, 31, 38 – 45. <https://doi.org/1093.ijpp/riac097>**

The aim of this UK study was to explore community pharmacists' practices, attitudes, and provision of care in the preconception and pregnancy period. A focus group with eleven community pharmacists was conducted to discuss barriers and facilitators to care, training, and ideas on how to improve preconception and pregnancy care. Three themes were identified: 1) community driven needs; 2) needs of community pharmacists, and 3) shared needs and understanding. The findings highlighted how, while women frequently consult with pharmacists, there are educational and organizational barriers that limit preconception substance use advice. There is a further need to incorporate risk minimization in order to promote both preconception and pregnancy health.

26. **Szewczyk, Z., Reeves, P., Kingsland, M., Doherty, E., Elliott, E., Wolfenden, L., Tsang, T. W., Dunlop, A., Searles, A., & Wiggers, J. (2022). Cost, cost-consequence and cost-effectiveness evaluation of a practice change intervention to increase routine provision of antenatal care addressing maternal alcohol consumption. *Implementation Science*, 17(1), 14. <https://doi.org/10.1186/s13012-021-01180-6>**

This clinical trial aimed to determine the cost, cost-consequence, and cost-effectiveness of developing and delivering an antenatal practice change intervention in New South Wales, Australia. The trial was co-designed by health service stakeholders, Aboriginal health organizations, and women, and involved practice change in antenatal care to provide brief advice to all pregnant women about the risks of alcohol use during pregnancy and to screen for alcohol risk status. Over 35 months, the costs and outcomes of the intervention were compared to usual care. The implementation cost was \$367,646 AUD, most for delivery costs (\$326,774 AUD) and the remainder for development costs. Of the delivery costs, most (70%) were related to labour. The intervention was found to be more effective than usual care, at a higher cost. The authors discuss the issue of healthcare funder willingness to pay for this kind of practice change, but purport that initial investment is expected to improve efficiency of practice change intervention over time.

27. **Trocin, K. E., Oga, E. A., Mulatya, C., Mark, K. S., & Coleman-Cowger, V. H. (2022). Patient perceptions of three substance use screening tools for use during pregnancy. *Maternal and Child Health Journal*, 26, 1488 – 1495. <https://doi.org/10.1007/s10995-022-03442-1>**

The aim of this US study was to understand pregnant women's perceptions of three validated substance use screening tools (the 4P's Plus; the NIDA Quick Screen/NIDA-Modified Alcohol, Smoking and Substance Use Involvement Screening Test; and the Substance Use Risk Profile-Pregnancy Scale). Interviews were conducted with a diverse sample of pregnant women ($n = 493$) to garner women's perceptions of each

screening tool and identify their preferred tool. More participants (43.4%) reported they preferred to 4P's Plus due to its comprehensive but concise nature. Fewer women reported that they preferred the NIDA Quick Screen (32.5%) and Substance Use Risk Profile Pregnancy Scale (24.1%). Women further expressed the importance of confidentiality and being screened by a non-judgemental provider.

28. **Tsang, T. W., Kingsland, M., Doherty, E., Anderson, A. E., & Tully, B., Ward, S., Wiggers, J., & Elliot, E. J. (2022). Written information and health professionals are the information sources about alcohol use in pregnancy most often used by pregnant women. *Drug and alcohol review, 41*(7), 1599-1609. <https://doi.org/10.1111/dar.13512>**

See above (Level 1).

29. **Tsang, T. W., Kingsland, M., Doherty, E., Wiggers, J., Attia, J., Wolfenden, L., Dunlop, A., Tully, B., Symonds, I., Rissel, C., Lecathelinais, C., & Elliott, E. J. (2022). Effectiveness of a practice change intervention in reducing alcohol consumption in pregnant women attending public maternity services. *Substance abuse treatment, prevention, and policy, 17*(1), 63. <https://doi.org/10.1186/s13011-022-00490-2>**

This Australian clinical trial examined the implementation of brief advice and referral with all women in antenatal services. The goal of the trial was to align brief interventions with local and international guidelines for care and reduce self-reported alcohol use during pregnancy. Women were advised about the risks of alcohol use during pregnancy and advised to abstain. Women who were classified as medium-risk drinkers were offered referral to a phone coaching service and high-risk drinkers were offered referral to a Drug and Alcohol Service. Pregnant women attending their 27/28 or 35/36-week gestation visits were randomly asked to participate in a survey, with a total of $n = 1,309$ women surveyed pre-intervention and $n = 2,540$ post-intervention. Significantly fewer women engaged in special occasion drinking at post-intervention compared to pre-intervention (8.43% vs. 11.59%). There was no observed change in the proportion of women classified as at-risk for drinking during pregnancy compared to no-risk. The authors reflect that other social determinants influencing alcohol use during pregnancy may need to be addressed in order to reduce alcohol use during pregnancy, beyond the population that drink at special occasions.

30. **Withanage, N. N., Botfield, J. R., Srinivasan, S., Black, K. I., & Mazza, D. (2022). Effectiveness of preconception interventions in primary care: a systematic review. *The British Journal of General Practice, 72*(725), e865-e872. <https://doi.org/10.3399/BJGP.2022.0040>**

This systematic review from Australian authors examined the effectiveness of primary care-based preconception care (PCC) delivered to females and males of reproductive age, evaluated as to improving health knowledge, reducing preconception risk factors, and improving pregnancy outcomes. Twenty-eight articles published between July 1999 and May 2021, reporting on 22 randomized controlled trials were included. All articles except one focused on females. Findings revealed that a range of primary care based PCC initiatives, including brief and intensive education, supplementary medication, and dietary modification, are effective for improving health knowledge and reducing preconception risk factors in females. Brief education was effective in improving health knowledge for females and males, reducing alcohol/tobacco use, and increasing folate use. Intensive education was found to reduce instances of spontaneous pregnancy loss, alcohol-exposed pregnancies, and increased physical activity. PCC involving supplementary medication was found to increase folate use and those focused on diet were found to reduce pre-eclampsia and increase birth weight. Four of the eight articles that reported on pregnancy outcomes found improvements. The authors conclude that more research is needed to understand the effects of primary care based PCC on pregnancy outcomes and to identify effectiveness of PCC for males.

31. **Wolfson, L., Poole, N., Harding, K. D., & Stinson, J. At a Juncture: Exploring Patterns and Trends in FASD Prevention Research from 2015 – 2021 Using the Four-Part Model of Prevention. *Journal of Fetal Alcohol Spectrum Disorder, 4*(SP1), e36-e59. <https://doi.org/10.22374/jfasd.v4iSP1.13>**

See above (Prevalence of, and influences and factors associated with, alcohol use in pregnancy).

D. Level 3 Prevention

1. **Bray, J. H., Zaring-Hinkle, B., Scamp, N., Tucker, K., & Cain, M. K. (2022). MIRRORS program: Helping pregnant and postpartum women and families with substance use problems. *Substance Abuse*, 43(1), 792–800. <https://doi.org/10.1080/08897077.2021.2010254>**

This US paper described the MIRRORS (Maternal Initiative for Reflective Recovery-Oriented Residential Services) program in Texas, which provided enhanced live-in substance use disorder treatment and recovery support for women and children through integrated, trauma-informed care and services. Pregnant and postpartum women ($n = 215$) were assessed at 3 time points: intake, discharge and 6-months post-intake using standardized measures of family functioning, parenting, recovery capital, and other outcomes. Multilevel modeling was employed to examine individual differences in trends over time. The evaluators found that over 80% of participants reported that the MIRRORS program enhanced their recovery treatment experience including significant improvements in their family functioning, problem solving, behavioral control, affective responsiveness, and communication. Outcomes indicate that the MIRRORS program was effective in improving family functioning and reducing substance use, thus enhancing women's functioning and recovery.

2. **Choi, S., Rosenbloom, D., Stein, M. D., Raifman, J., & Clark, J. A. (2022). Differential Gateways, Facilitators, and Barriers to Substance Use Disorder Treatment for Pregnant Women and Mothers: A Scoping Systematic Review. *Journal of Addiction Medicine*, 16(3), e185–e196. <https://doi.org/10.1097/ADM.0000000000000909>**

This scoping systematic review conducted by US researchers summarized findings on the pathways, facilitators, and barriers to treatment for pregnant women and mothers with a substance use disorder. Scholarly and peer-reviewed articles published in English from 1996 to 2019 were included ($n = 41$ articles). A thematic analysis of the selected studies was used to summarize pathways to treatment and to identify gaps in the research. Multiple gateway institutions were identified: health care settings, social service agencies, criminal justice settings, community organizations, and employers. Some of the identified facilitators and barriers to substance use disorder treatment were unique to pregnant women and mothers (i.e., fear of incarceration for child abuse). Women were motivated to seek treatment by both personal (i.e., emotional support and social support) and child-related factors (i.e., loss of children, suspension or termination of parental rights, the anticipation of reuniting with children). Major access barriers included fear, stigma, charges of child abuse, inconvenience, and financial hardship. The authors note that there has been progress in implementing different types of interventions and treatments attentive to pregnant women and mothers' needs. The authors developed a conceptual model that characterized women's pathways to treatment by gateway type and by indirect, direct, and institutional barriers.

3. **Chou, J. L., Noel, J. G., Williams, C., Spruell, S., Nixon, K., Riedel, E. & Zaarur, A. (2022). Residential substance use treatment outcomes for pregnant and postpartum women: Distinct patterns for women enrolled before versus during the COVID-19 pandemic. *Journal of Nursing Scholarship*. <https://doi.org/10.1111/jnu.12803>**

This US study examined outcomes of $n = 136$ pregnant and parenting women participating in the Healthy Families Program (HFP) States in order to explore differences in treatment outcomes for women who enrolled in services before, versus during, the COVID-19 pandemic. HFP is a comprehensive program for pregnant and parenting women located within a gender-specific substance use treatment facility in the US. Results indicated that from treatment intake to follow-up assessment, clients self-reported statistically significant improvements in family functioning and daily functioning as well as reduced days of substance use. The rate of treatment intakes declined during the COVID-19 pandemic. Mental health indicators showed improvements only for clients engaged in treatment before the COVID-19 pandemic and not for clients served

during the COVID-19 pandemic. Substance use decreased significantly for both pre-pandemic and pandemic participants. The authors discuss specialized treatment and relapse prevention considerations and implications for pregnant and parenting women, including a need for added emphasis on co-occurring mental health symptoms and family system stress during a pandemic, and the role of nurses in identifying and addressing these concerns. This research highlights the importance of specialized treatment programming for pregnant and parenting women with substance use disorders, and the need for additional recovery support mechanisms to be utilized during the COVID-19 pandemic.

4. **Courchesne-Krak, N. S., Kepner, W., Rubano, A., & Marienfeld, C. (2022). "Differences in outpatient, emergency, and inpatient use among pregnant women with a substance-related diagnosis." *American Journal of Obstetrics & Gynecology*, 4(2): 100559.**
<https://doi.org/10.1016/j.ajogmf.2021.100559>

The goal of this US study was to evaluate the differences in the use of outpatient clinical visits, emergency department visits, and hospital inpatient days among women with and without a substance-related diagnosis during the prenatal period. Data from electronic health records for women (ages 18-44) who delivered a single live birth or stillbirth at ≥ 20 weeks of gestation from 2012 - 2019 were examined. From the total sample ($n = 16,770$), a cohort matched for key demographic characteristics was created, consisting of 1986 deliveries. Of these, most were white (51.0%), or mixed race, or of another race of (31.1%). The mean age was 29.8. Women with a substance-related diagnosis were more likely to have ≤ 10 outpatient visits, ≥ 1 emergency visits, and ≥ 3 inpatient days. Alcohol-, opioid-, and stimulant-related diagnoses were independently associated with ≤ 10 outpatient visits. Opioid-, stimulant-, and nicotine-related diagnoses were independently associated with ≥ 1 emergency visits and ≥ 3 inpatient days. The findings highlighted how women with a substance-related diagnosis during the prenatal period who delivered a single live birth or stillbirth at ≥ 20 weeks of gestation experienced fewer outpatient visits, more emergency department visits, and more inpatient days than women without a substance-related diagnosis. The type of substance-related diagnosis (e.g., alcohol, opioids, stimulants, or nicotine) was associated with different patterns of healthcare use. The authors note that it is important to identify substance-related diagnoses in pregnant women early to minimize disproportionate healthcare service utilization through intervention and treatment.

5. **Flannigan, K., Odell, B., Rizvi, I., Murphy, L., & Pei J. (2022) Complementary therapies in substance use recovery with pregnant women and girls. *Women's Health*, 18.**
<https://doi.org/10.1177/17455057221126807>

This Canadian study identified and examined the use and uptake of complementary therapies in a substance use recovery program for pregnant women and girls. Feedback from $n = 255$ women and girls (mean age = 27.5 years) were analysed using Pearson chi-square tests, logistic regression, and inductive content analysis. The most frequently provided complementary therapies were yoga, energy-related activities (e.g., reiki, reflexology), and meditation. Among the most common complementary therapies, participants provided the highest endorsements for massage and physical activity, and the lowest endorsements for yoga and drumming. Across complementary therapies, whether participants looked forward to an activity contributed significantly to whether they found it helpful, would like to do it again, or planned to continue engaging in the activity after leaving the program. Four broad contextual factors were identified that may impact experiences and perspectives about CTs: (1) goodness of fit, (2) self-awareness, (3) growth, and (4) healing and holistic wellbeing. This study provides evidence on the potential impacts of CTs in substance use treatment for pregnant women and girls, and important contextual factors to consider when implementing these approaches.

6. **Jones, H. E., Apsley, H. B., Cocowitch, A., Merrill, T., McGlothlin, S., Middleseadt-Ellerson, R., Andringa, K., O'Grady, K. E. (2022). Increasing knowledge about recovery-related life domains among pregnant and parenting women in comprehensive substance use disorder treatment: The Art of Addiction Recovery Program, *Drug and Alcohol Dependence*, 232, 109252.**
<https://doi.org/10.1016/j.drugalcdep.2021.109252>

This US study provided an overview of the Art of Addiction Recovery Program, a manualized group treatment program imbedded within a comprehensive substance use disorder treatment program for pregnant and parenting women. The Program consists of 14 sessions, each focusing on a different topic (i.e., health, relationships, the recovery process, etc.) that are presented by a facilitator, followed by group discussion and a creative project. The evaluators used a single-group pretest-post-test design to provide an initial evaluation. Participants were $n = 51$ women, the majority of whom reported having an opioid use disorder (69%), stimulant disorder (22%) and alcohol use disorder (10%) as their primary disorder. 82% of women also reported current tobacco use. Significant ($p < 0.001$) pre- to post-session increases in session-specific knowledge occurred for all 14 sessions with a measure of multivariate association indicating that these changes were substantial. Ratings of learning and effectiveness were generally high. The findings suggest that the Program was effective in conveying knowledge about substance use and recovery, and that participants increased their knowledge and generally strongly agreed that the sessions both provided high levels of learning and were highly effective. The authors conclude that The Art of Addiction Recovery Program provides an option for pregnant and parenting women seeking a group treatment program, filling a gap in group programming designed specifically for this population.

7. **Hodges, M., Chambers, J. E., Denne, S., Wiehe, S. E., Tang, Q., Park, S., & Litzelman, D. (2022). Associations of Mental Health Measures and Retention in a Community-Based Perinatal Care Recovery Support Program for Women of Childbearing Age with Substance Use Disorder. *Journal of Dual Diagnosis*, 18(4), 211–219. <https://doi.org/10.1080/15504263.2022.2124008>**

This US study evaluated the factors related to program retention among participants in a community-based peer recovery program for women of childbearing age with a history of substance use disorder. Retention of women of childbearing age ($n = 184$), half of whom were pregnant or postpartum, were examined at the 2 and 6-month marks. Participants in the programming were paired with a peer recovery coach, licensed perinatal community health workers who had a personal history of substance use disorder and assisted with healthcare system navigation, facilitated access to local resources, and provided advice and emotional support. Independent variables included gestational status, depression, anxiety, type and frequency of substance use, childhood trauma, abuse, readiness for treatment, and attachment patterns. The authors found anxiety to be a key factor associated with retention. Moderate anxiety was associated with higher rates of retention compared to normal to mild anxiety. Severe anxiety was associated with lower rates of retention compared to normal to mild anxiety. Attrition was highest in the first 2 months. The authors concluded that early integration with mental health services to address severe anxiety symptoms could potentially improve retention in substance use disorder recovery programs, thereby improving outcomes. More research is needed regarding severe anxiety and care-avoidant behaviors, particularly among women of childbearing age.

8. **McKinney, J.R., Russell, M., Avellaneda-Ojeda, A., Gannon, C., Zambare, S., Hansford, M., Moukaddam, N., & Eppes, C. (2022). A Comprehensive Care Approach for Pregnant Persons with Substance Use Disorders. *International Journal of Mental Health and Addiction*. <https://doi.org/10.1007/s11469-022-00760>**

This US commentary described a multidisciplinary comprehensive care model for pregnant people who use substances. The model integrates obstetrics, addiction psychiatry and psychology, neonatology, anesthesiology, social work and case management, community services and resources, and the local legal system. Challenges with each component of the model are briefly described. The authors described the interdisciplinary clinic approach as a best practice approach and note that integration of addiction psychiatry/psychology, social work, and community services into prenatal care is crucial in achieving optimal outcomes for pregnant persons who use substances. The inclusion of multiple services allows for more diverse service delivery, lessons learned within each specialty, and provides an outline for providers and medical facilities for development of interdisciplinary clinics to meet the needs of this vulnerable patient population.

9. **Newell, S. M., Stem, J., & Lanzillotta-Rangeley, J. (2022). Virtual Peer Support in Women's Health for Pregnant People and Mothers with Substance Use Disorder. *Nursing for women's health*, 26(3), 226–233. <https://doi.org/10.1016/j.nwh.2022.03.001>**

This US study evaluated the effectiveness of a virtual peer support group for mothers and pregnant people with substance use disorder who were connected to a hospital-based women's health unit. Participants ($n = 13$) attended a 12-week session of facilitated substance use disorder peer support meetings through an online virtual format. Pre- and post-surveys were conducted to evaluate mental health and substance use outcomes. The authors found that stress and anxiety were reduced, on average, by 25%, and responses to open-ended questions showed that participants found the meetings helpful for developing coping mechanisms. The virtual space was seen as a comfortable, safe space where participants were able to develop community. The authors conclude that peer support meetings have been found to be effective in the treatment of people with substance use disorder and that women's health units are an appropriate location where nurses can integrate this established evidence-based treatment modality.

10. **Palacios, M., Díaz, M. M., Aracena, P., Palomino, T., & Quintana, N. (2022). Accompaniment process, gender focus, and women in alcohol/drug consumption in pregnancy and motherhood: Transdisciplinary keys and occupational therapies from the south. *Cadernos Brasileiros de Terapia Ocupacional*, 30, e3228. <https://doi.org/10.1590/2526-8910.ctoA0246732282>**

This article described a model for drug and/or alcohol treatment for pregnant and postpartum women involved in a hospital-based Intensive Outpatient Program for Women in San Bernardo, Chile. The authors described the 'accompaniment' involved in the model, through a gender lens and as carried out by the health team working in the program. Nine semi-structured group interviews were conducted with service providers and young women. The findings highlighted the importance of transdisciplinarity; actions that reflect women's rights, gender, networks, and community; trust in the work environment; and the provision of spaces for growth, learning, and conflict resolution. The results highlight those accompaniments from a gender and human rights perspective are key to reducing equity gaps, addressing social and structural barriers to treatment, and increasing access to health for women who use substances.

11. **Smith, P.A., Kilgour, C., Rice, D., Callaway, L. K., & Martin, E. K. (2022). Implementation barriers and enablers of midwifery group practice for vulnerable women: a qualitative study in a tertiary urban Australian health service. *BMC Health Services Research*, 22, 1265. <https://doi.org/10.1186/s12913-022-08633-8>**

This Australian study identified the barriers and facilitators that impact the implementation of a midwifery group practice for women with a history of substance use (alcohol, tobacco and other drugs), mental health challenges, complex social issues or other vulnerability. An interdisciplinary group of service providers ($n = 31$) from a single-site tertiary health service participated in semi-structured interviews. The authors identified five primary themes: women's experiences; midwifery workforce capabilities; identifying "gold standard care"; the interdisciplinary team; and costs. Potential enablers of implementation included the belief that the model facilitated a relationship and trust with clients, that clinical benefit outweighed the costs, and universal stakeholder acceptance. Potential barriers included potential isolation of the interdisciplinary team, costs, and the risk of midwives experiencing vicarious trauma. The findings highlighted a recognition that the proposed model of care was supported by research, that clinical benefits will outweigh costs, and how essential interdisciplinary care is in service provision. However, further supervision and support is required to reduce risk of vicarious trauma. The authors note that this research can support planning for improved care for vulnerable women, and improved access to midwifery care for vulnerable women.

12. **West, A., Schultz, D., Schacht, R. L., Barnet, B., DiClemente, C., & LaCasse, M. L. (2022). Evaluation of interprofessional training to strengthen communication and coordination among providers working with expectant mothers and infants affected by substance use. *Children and Youth Services Review*, 132, 106331. <https://doi.org/10.1016/j.childyouth.2021.106331>**

This US study examined the acceptability, perceived utility, and preliminary outcomes of a hybrid (online and in-person) interprofessional training program for providers working in child welfare, early intervention, and maternal and early childhood home visiting programs ($n = 104$). The findings demonstrated improvements in knowledge and confidence among all provider types following the training. Among home visitor and early intervention providers, there were improvements in perceptions of having the resources needed to collaborate with child welfare. The authors found that the training was acceptable and useful to providers. This before and after study provides support for interprofessional training to improve provider competence and ability to collaborate when working with substance involved families.

13. **Wolfson, L., Poole, N., Harding, K. D., & Stinson, J. At a Juncture: Exploring Patterns and Trends in FASD Prevention Research from 2015 – 2021 Using the Four-Part Model of Prevention. *Journal of Fetal Alcohol Spectrum Disorder*, 4(SP1), e36–e59. <https://doi.org/10.22374/jfasd.v4iSP1.13>**

See above (Prevalence of, and influences and factors associated with, alcohol use in pregnancy).

E. Level 4 Prevention

1. **Bray, J. H., Zaring-Hinkle, B., Scamp, N., Tucker, K., & Cain, M. K. (2022). MIRRORS program: Helping pregnant and postpartum women and families with substance use problems. *Substance Abuse*, 43(1), 792–800. <https://doi.org/10.1080/08897077.2021.2010254>**

See above (Level 3).

2. **Choi, S., Rosenbloom, D., Stein, M. D., Raifman, J., & Clark, J. A. (2022). Differential Gateways, Facilitators, and Barriers to Substance Use Disorder Treatment for Pregnant Women and Mothers: A Scoping Systematic Review. *Journal of Addiction Medicine*, 16(3), e185–e196. <https://doi.org/10.1097/ADM.0000000000000909>**

See above (Level 3).

3. **Chou, J. L., Noel, J. G., Williams, C., Spruell, S., Nixon, K., Riedel, E. & Zaarur, A. (2022). Residential substance use treatment outcomes for pregnant and postpartum women: Distinct patterns for women enrolled before versus during the COVID-19 pandemic. *Journal of Nursing Scholarship*. <https://doi.org/10.1111/jnu.12803>**

See above (Level 3).

4. **Dauber, S., Beacham, A., Hammond, C., West, A., & Thrul, J. (2022). Adaptive Text Messaging for Postpartum Risky Drinking: Conceptual Model and Protocol for an Ecological Momentary Assessment Study. *JMIR Research Protocols*, 11(4), e36849. <https://doi.org/10.2196/36849>**

This US study described a conceptual model of postpartum risky alcohol use and a protocol for conducting an ecological momentary assessment with mothers in order to refine the development of a tailored SMS text messaging intervention designed for new mothers who drink at risky levels. The preliminary conceptual model of postpartum risky drinking was based on the motivational model of alcohol use, social cognitive theory, and temporal self-regulation theory and focused on three primary intervention targets: motivation, self-efficacy, and self-regulation. The paper described procedures for the study to collect ecological momentary assessment data from $n = 30$ participants recruited via social media and the perinatal Central Intake system of New Jersey. The study findings will enhance understanding of daily and momentary fluctuations in risk and protective factors for risky drinking during the early postpartum period and will inform the refinement of the conceptual model and the development of the text messaging intervention. This intervention can be supportive to women who may otherwise not seek treatment for risky alcohol use out of fear and stigma.

5. **Hodges, M., Chambers, J. E., Denne, S., Wiehe, S. E., Tang, Q., Park, S., & Litzelman, D. (2022). Associations of Mental Health Measures and Retention in a Community-Based Perinatal Care Recovery Support Program for Women of Childbearing Age with Substance Use Disorder. *Journal of Dual Diagnosis*, 18(4), 211–219. <https://doi.org/10.1080/15504263.2022.2124008>**

See above (Level 3).

6. **Ingalls, A., Rebman, P., Martin, L., Kushman, E., Leonard, A., Cisler, A., Gschwind, I., Brayak, A., Amsler, A. M., & Haroz, E. E. (2022). Towards precision home visiting: results at six months postpartum from a randomized pilot implementation trial to assess the feasibility of a precision approach to Family Spirit. *BMC Pregnancy and Childbirth*, 22(1), 725. <https://doi.org/10.1186/s12884-022-05057-4>**

This US pilot study aimed to assess the acceptability of a precision approach to a home visiting model, Family Spirit® and explore potential differences between this specialized approach (PFS) with home visiting services as usual (SFS). The PSF intervention included up to 17 core lessons plus up to 13 additional lessons as needed. The additional topics related to four areas of self-reported need or concern: 1) being a first-time mother, 2) identified substance misuse, 3) nutrition concerns for themselves or their baby and 4) sexual/reproductive health concerns. The study included $n = 60$ participants who were pregnant or within 2 months postpartum. Mothers in both the precision and standard care groups reported positive program acceptability, satisfaction, and home visitor-participant relationships at 6 months postpartum. However, open-ended feedback from standard care participants indicates that some lesson content may not be applicable to, or needed by, all participants. At 6 months, retention was 82.3% for PFS and 66.7% for SFS, and adherence was 30.1% for PFS and 20.6% for SFS. The authors note that preliminary findings indicate that precision home visiting may be acceptable and feasible and less resource intensive.

7. **Jones, H. E., Apsley, H. B., Cocowitch, A., Merrill, T., McGlothlin, S., Middleseadt-Ellerson, R., Andringa, K., O'Grady, K. E. (2022). Increasing knowledge about recovery-related life domains among pregnant and parenting women in comprehensive substance use disorder treatment: The Art of Addiction Recovery Program, 232, 109252. <https://doi.org/10.1016/j.drugalcdep.2021.109252>**

See above (Level 3).

8. **Kanda, K., Blythe, S., Grace, R., Elcombe, E., & Kemp, L. (2022). Does customised care improve satisfaction and positively enable parents in sustained home visiting for mothers and children experiencing adversity? *BMC Health Services Research*, 1361. <https://doi.org/10.1186/s12913-022-08759-9>**

This Australian study examined the relationship between customized care that is responsive to mothers' risk factors and parental satisfaction and enablement in the delivery of the Maternal Early Childhood Sustained Home-visiting program (MECSH). MECSH is a structured nurse-delivered program designed to address health inequities experienced by families experiencing significant adversity. Program delivery data collected in the intervention arm ($n = 352$ women) of a large randomised controlled trial of a MECSH-based sustained nurse home visiting program in Australia (right@home) were analyzed. Customised care was defined as appropriate provision of care content in response to four maternal risks: smoking, mental health, domestic violence and alcohol and drug use. Parent satisfaction and parent enablement were measured when children were 24 months old. Logistic analysis was performed to assess the impact of customised care on parent satisfaction and enablement while adjusting for covariates such as sociodemographic factors. The results indicated high levels of satisfaction with the care provided and positive enablement. There were several sociodemographic factors associated with satisfaction and enablement, such as language spoken at home and employment experience. The mothers who received customized care for mental health risk and domestic violence had significantly greater satisfaction with the care provided and experienced an increase in enablement

compared to those who did not receive such care. The authors conclude that it is essential for the sustained nurse home visiting service model to be flexible to cater for variations according to family circumstances and needs while maintaining a core of evidence-based practice.

9. **Kanda, K., Blythe, S., Grace, R., Elcombe, E., & Kemp, L. (2022). Variations in sustained home visiting care for mothers and children experiencing adversity. *Public Health Nursing*, 39(1), 71–81. <https://doi.org/10.1111/phn.13014>**

This Australian study looked at the delivery of sustained home visiting program, beginning in pregnancy and continuing until the child was 2 years old, designed to address health inequities faced by families experiencing adversity. Data collected from the right@home program (see above) was used to identify the extent to which there were variations in home visiting care in response to the families' risk factors. The results showed that where risk factors included smoking, mental health, domestic violence, and drugs and alcohol were present, mothers were much more likely to have specific content delivered related to those risks compared to mothers where those risk factors were not present. However, the mothers with smoking and mental health risks were more likely to have received specific content than those who had domestic violence and drug and alcohol risks. The authors identified known barriers to the delivery of domestic violence and substance use programming, including provider self-efficacy, and recommended professional capacity development of nurses in how to respond to domestic violence and substance issues in order to provide quality care for families facing adversity.

10. **Newell, S. M., Stem, J., & Lanzillotta-Rangeley, J. (2022). Virtual Peer Support in Women's Health for Pregnant People and Mothers with Substance Use Disorder. *Nursing for Women's Health*, 26(3), 226–233. <https://doi.org/10.1016/j.nwh.2022.03.001>**

See above (Level 3).

11. **Palacios, M., Díaz, M. M., Aracena, P., Palomino, T., & Quintana, N. (2022). Accompaniment process, gender focus, and women in alcohol/drug consumption in pregnancy and motherhood: Transdisciplinary keys and occupational therapies from the south. *Cadernos Brasileiros de Terapia Ocupacional*, 30, e3228. <https://doi.org/10.1590/2526-8910.ctoA0246732282>**

See above (Level 3).

12. **Tsantefski, M., Tidyman, A., Rose, J., & Wilde, T. (2022). Sustainable social networks for mothers in recovery: The mirror families model. *Journal of Social Work Practice In the Addictions*. <https://doi.org/10.1080/15333256X.2022.2137990>**

The aim of this Australian study was to report findings from the Mirror Families™ pilot project. Mirror Families was created to support parental substance use recovery, prevent child removal, lessen the need for professional intervention, establish a continuity of relationships for mothers and children, and develop a social support network and community for mothers and children. A mixed methods analysis was conducted. Four key themes were identified: the transition from isolation to social connection; honesty, building trust, and help seeking skills; social networks as a bridge to safety and children's wellbeing; and self-efficacy and responsive service delivery through the development of a social network. The findings demonstrated that pilot was effective in addressing its main objectives.

13. **Wolfson, L., Poole, N., Harding, K. D., & Stinson, J. At a Juncture: Exploring Patterns and Trends in FASD Prevention Research from 2015 – 2021 Using the Four-Part Model of Prevention. *Journal of Fetal Alcohol Spectrum Disorder*, 4(SP1), e36–e59. <https://doi.org/10.22374/jfasd.v4iSP1.13>**

See above (Prevalence of, and influences and factors associated with, alcohol use in pregnancy).

F. Supportive Alcohol and Child Welfare Policy

1. **Adebiyi, B. O., & Mukumbang, F.C. (2022). Alcohol ban during the COVID-19 pandemic lockdown: Lessons for preventing foetal alcohol spectrum disorder in South Africa. *African Journal for Primary Health Care and Family Medicine*, 14(1):e1-e4. <https://doi.org/10.4102/phcfm.v14i1.3686>**

This South African commentary described alcohol restrictions put into place during the COVID-19 pandemic, including the impact and potential benefits on FASD prevention efforts. The authors demonstrated how the alcohol bans during the COVID-19 lockdown reduced the short-term effects of alcohol and recommend that the South African national liquor policy, the 2012 drafted Bill for Control of Marketing and Alcoholic Beverages, and the World Health Organization best buys, should be implemented. Implementing such policies can regulate the making, distribution, advertising, promotion, and availability of alcoholic beverages in South Africa, to positively impact the incidence and prevalence of FASD.

2. **Deutsch, A. R., Jalali, M. S., Stout, S. & Frerichs, L. (2022). Equitable policies need equitable practices: Alcohol- and substance-exposed pregnancy as a case study. *Health Promotion Practice*. <https://doi.org/10.1177/15248399221107605>**

This article from US authors described how systems science methods can be used to identify which alcohol and substance exposed prevention and intervention policies are promoting health and reducing inequities. The authors suggest additional steps are required in systems science methods, such as evaluating system structure differences, grounding the model and testing it with cultural and community sources of resiliency and strength, and ensuring policies can be sustainable in implementation and impact. The authors used alcohol and substance-exposed pregnancy as an example of where additional systems science methods can be integrated, along with community-based participatory approaches, to ensure that policy development is grounded in shared and equitable decision-making processes.

3. **Deutsch, S. A., Donahue, J., Parker, T., Hossain, J., Loiselle, C., & De Jong, A. R. (2022). Impact of plans of safe care on prenatally substance exposed infants. *The Journal of Pediatrics*, 241, 54 – 61.e7. <https://doi.org/10.1016/j.jpeds.2021.10.032>**

This US study assessed the family characteristics of infants affected by prenatal substance exposure and the type and distribution of Plans of Safe Care referrals to community-based programs following the federal statute changes. A retrospective analysis of Delaware's statewide child welfare case registry (2018 – 2020) was conducted. The majority (67.2%) of infants prenatally substance exposed were exposed to a single substance prenatally and nearly a quarter of mothers had previously had a substance exposed pregnancy. However, from 2018 – 2022, 93% had Plans of Safe Care support, and nearly 90% avoided out-of-home placement. Less than half (40%) of mothers had previous history of child welfare involvement, 43.5% of mothers and 9.1% of fathers were referred to community-based services (including substance use, mental health, parenting services, etc.) and more than half (58%) of infants were referred for pediatric/developmental assessment. The authors conclude that Plans of Safe Care are important to fostering supportive, protective linkages to community-based programs for infants prenatally exposed to substances and their families.

4. **Finlay-Jones, A., Elliott, E., Chapman, A., Halliday, J., Jones, H., Kippin, N., Mullan, N., Passmore, H., Reibel, T., Reynolds, N., Symons, M., Tsang, T. W., Watkins, R., & Bower, C. (2022). It takes a village: Influencing policy and practice to prevent alcohol use in pregnancy and promote better outcomes for individuals living with Fetal Alcohol Spectrum Disorder. *International Journal of Population Data Science*, 6(1), 1703. <https://doi.org/10.23889/ijpds.v6i1.1703>**

This article described FASD Research Australia, a Centre of Research Excellence (CRE), that aims to prevent alcohol use in pregnancy, decrease incidence of FASD, and improve the national diagnostic capacity and management. Partnerships, consumer, and community involvement play a central role in the CRE's activities.

This article further describes the CRE's policy and practice approaches, including stakeholder engagement processes, and the key principles that underscore the work. The article provides policy and practice examples that have been achieved through the last five years, as well as challenges in translating the findings of their work. They emphasize the importance of long-term funding, dedicated researchers, and ongoing engagement with stakeholders and consumers, and evaluation of program and policy strategies in order to continue to conduct research and develop supportive policies and programs.

5. **Heenan, M., Shanthosh, J., Cullerton, K., & Jan, S. (2022). Influencing and implementing mandatory alcohol pregnancy warning labels in Australia and New Zealand. *Health Promotion International*. <https://doi.org/10.1093/heapro/daac022>**

See above (Level 1).

6. **Lee, E., Bristow, J., Arkell, R., & Murphy, C. (2022). Beyond 'the choice to drink' in a UK guideline on FASD: the precautionary principle, pregnancy surveillance, and the managed woman. *Health, Risk & Society*, 17 – 35. <https://doi.org/10.1080/13698575.2021.1998389>**

This UK discourse analysis assessed the movement towards alcohol abstinence in international guidance in relation to recent UK alcohol guidance. Using *SIGN 156: Children and young people exposed prenatally to alcohol, A national clinical guideline*, the authors described the role of the precautionary principle and how, despite supporting guidance and practice, it also can perpetuate increased surveillance of pregnant women. Further research is encouraged that explores the impact of prenatal alcohol disclosure and the impacts of guidance on women's autonomy.

7. **Kenny, M. C., Mathews, B., & Papthirana, M. (2022). Responses to prenatal opioid and alcohol abuse: A review of US and Australian mandatory reporting laws. *Child Abuse Review*, e2773. <https://doi.org/10.1002/car.2775>**

This review explored duty to report maternal substance use during pregnancy in Australia and the US. The authors identified variations in who is required to report, in which circumstances substance use must be reported, and what indicates child abuse or neglect. The differences across laws draws attention to the inconsistencies, and how reforms may be made to improve provision and support. The authors make recommendations for federal policy reform in the US in order to promote the development of plans of safe care for both women and their children.

8. **Harmsen van der Vliet-Torij, H.W., Venekamp, A.A., van Heijningen-Tousain, H.J.M., Wingelaar-Loomans, E., Scheele, J., de Graaf, J. P., Lambregtse-van den Berg, M. P., Steegers, E. A. P. & Goumans, M. J. B. M. (2022). Development of a Blueprint for Integrated Care for Vulnerable Pregnant Women. *Maternal Child Health J* 26, 451–460. <https://doi.org/10.1007/s10995-021-03340-y>**

This article from the Netherlands described a consortium of 100 organizations representing providers, educators, researchers, and policymakers to support maternal and child health and social service providers in providing integrated care for pregnant women. Three studies focusing on population characteristics of vulnerable pregnant women and organizational knowledge, attitudes, and practice were conducted. This research supported a blueprint that was locally adapted. Interviews ($n = 12$) were conducted to evaluate the adaption of the blueprint and its integration in collaborative partnerships. The consortium process can be used by other jurisdictions to create uniformity in integrated care provision for vulnerable pregnant women.

9. **Maclean, J. C., Witman, A., Durrance, C. P., Atkins, D. N., & Meinhofer, A. (2022). Prenatal substance use policies and infant maltreatment reports. *Health Affairs*, 41(5). <https://doi.org/10.1337/hlthaff.2021.01755>**

The aim of this US study was to examine the effect of punitive and supportive prenatal substance use state-level policies on child maltreatment reports. Using a difference-in-difference analysis, the authors found that infant maltreatment reports increased by 19% following the implementation of punitive state policies (2004 – 2018), which is attributed to a 38% increase in substantiated reports of mothers as alleged perpetrators. However, there were no changes in infant maltreatment reports following the adoption of supportive policies. The findings suggest that punitive policies can increase substantiated child maltreatment, which may result in child welfare involvement soon after childbirth. The authors recommend further interventions that emphasize wellbeing and support for mothers and infants.

10. **Roberts, S. C. M., Zaugg, C., & Martinez, N. (2022). Health care provider decision-making around prenatal substance use reporting. *Drug and Alcohol Dependence*, 237, 109514. <https://doi.org/10.1016/j.drugalcdep.2022.109514>**

The aim of this US study was to understand the factors that influence health care providers' substance use reporting practices. Semi-structured interviews ($n = 37$) were conducted with hospital-based obstetricians/gynecologists, family medicine physicians, and emergency department physicians to understand reporting of pregnant people with alcohol use disorders to government authorities. The majority of participants viewed reporting as someone else's responsibility, namely social workers. While several participants associated reporting with increased connection to services, many others expressed their awareness of the adverse consequences associated with reporting. Participants expressed their concerns about the potential harms to the baby that may emerge from not reporting, but expressed that interpersonal, hospital-level and state policy-level factors constrained their decision-making. The authors found that many of the factors that influence physician decision-making regarding reporting were outside of the control of individual physicians and thus require social, structural, and policy changes.

11. **Smith, T. L., Zufferey, C., Bilic, S., & Loeser, C. (2022). Questioning policy representations of women's alcohol consumption: Implications for social work. *Qualitative Social Work*, 21(4), 731 – 747. <https://doi.org/10.1177/1473350211024086>**

The aim of this Australian discourse analysis was to deconstruct policy discourses around women's alcohol consumption. The authors draw on Carol Bacchi's *What's the Problem Represented to Be? (WPR) Framework*, in their analysis of Australian policies, including the *National Alcohol Strategy (2019 – 2028)* and the *Australian Guidelines to Reduce Health Risks from Drinking Alcohol (2009, 2020)*. The findings suggest that policy discourse focuses on the effects of women's alcohol consumption on the unborn child through emphasizing women's assumed reproductive roles. Social policy medicalizes and reinforces normative gender discourse on women's alcohol use. The findings can be used to support social workers to understand the impacts of alcohol policy on women, such as the shame and stigma that policies can perpetuate.

12. **Wolfson, L., Poole, N., Harding, K. D., & Stinson, J. At a Juncture: Exploring Patterns and Trends in FASD Prevention Research from 2015 – 2021 Using the Four-Part Model of Prevention. *Journal of Fetal Alcohol Spectrum Disorder*, 4(SP1), e36–e59. <https://doi.org/10.22374/jfasd.v4iSP1.13>**

See above (Prevalence of, and influences and factors associated with, alcohol use in pregnancy).

G. Other – stigma, ethical issues, and systemic approaches

1. **Binder, A., Preiser, C., Hanke, S., Banabak, M., Huber, C., Petersen, K. U., & Batra, A. (2022). Researching Alcohol Consumption During Pregnancy. Opportunities and Challenges with Two Methods of Data Acquisition. *Qualitative Health Research*, 32(12), 1809–1827. <https://doi.org/10.1177/10497323221119005>**

This German study examined the opportunities and challenges of social media compared to telephone interviews, as a qualitative data source to understand alcohol use during pregnancy. The authors analyzed

nine discussion threads and seven interviews about alcohol use during pregnancy. The authors found that the telephone interviews showed a milder form of communication and tolerance, compared to online discussion forums where more hostility was present. However, in discussion forums, participants were more able to express themselves clearly. Understanding these nuances can be important in developing appropriate research approaches and methodologies.

2. **Bright, V., Riddle, J., & Kerver, J. (2022). Stigma experienced by rural pregnant women with substance use disorder. A scoping review and qualitative synthesis. *International Journal of Environmental Research and Public Health*, 19, 15065. <https://doi.org/10.3390/ijerph192215065>**

This scoping review from US authors synthesized literature on the stigma that rural, pregnant women with substance use disorders experience. English-language literature from Canada and the US was searched in three databases and $n = 9$ studies were included in the review. Common themes included the occurrence of stigma in community and healthcare settings. The effects of stigma are reduced when women have social support and access to comprehensive care networks. Addressing stigma through peer support or comprehensive, wraparound programming, can support pregnant, rural women with substance use disorders further address their health and wellbeing.

3. **Choate, P., Badry, D., & Bagley, K. (2022). The alcohol industry and social responsibility: Links to FASD. *International Journal of Environmental Research and Public Health*, 19, 7744. <https://doi.org/10.3390/ijerph19137744>**

This commentary from Canadian and Australian researchers described the key issues related to alcohol consumption and social responsibility and key approaches to the alcohol industry's approach to social responsibility based on case studies from Canada, Australia, and New Zealand. The authors describe the place of alcohol in society, the costs of FASD and alcohol related harm, and the impetus for public health partnerships with the alcohol industry. This commentary highlights potential conflicts of interest and ethical challenges associated with partnerships with the alcohol industry.

4. **Culp, F., Wu, Y., Wu, D., Ren, Y., Raynor, P., Hung, P., Qiao, S., Li, X., & Eichelberger, K. (2022). Understanding Alcohol Use Discourse and Stigma Patterns in Perinatal Care on Twitter. *Healthcare*, 10(12):2375. <https://doi.org/10.3390/healthcare10122375>**

This US study analyzed Twitter data on perceptions and behaviours related to alcohol use during pregnancy. Thematic content analysis of 500 alcohol-related tweets (2019 – 2021) outlined the individual, interpersonal, and population-level stigmas about perinatal alcohol use and mothers who used alcohol during pregnancy. The findings suggest that the Twitter platform has not been used for support and assistance due to societal stigma. Understanding the different uses of social media platforms can help with development of prevention strategies that could assist Twitter users struggling with perinatal alcohol use.

5. **Harding, K., Dionne, A., & Harding, E. (2022). "You don't want to drink? What are you, pregnant?!" Portrayals of alcohol and substance use during pregnancy on television. *Journal of Fetal Alcohol Spectrum Disorder*, 4(SP1), e129 – e161. <https://doi.org/10.22374/jfasd.v4iSP1.19>**

The aim of this Canadian study was to explore the portrayal of alcohol and other substance use during pregnancy on 25 shows on prime time and streaming services in North America. Using ethno-graphic content analysis, an overarching narrative surrounding women's alcohol and other substance was identified. The shows portray the misrepresentation of the safety of alcohol use and the difficulties of keeping a pregnancy private. The shows also show the portrayal of women who prenatally use alcohol as villains. The findings demonstrate the need to provide consistent messaging about the risks of alcohol use in pregnancy, as to not further contribute to misinformation.

6. **Lee, E., Bristow, J., Arkell, R., & Murphy, C. (2022). Beyond 'the choice to drink' in a UK guideline on FASD: the precautionary principle, pregnancy surveillance, and the managed woman. *Health, Risk & Society*, 17 – 35. <https://doi.org/10.1080/13698575.2021.1998389>**

See above (supportive alcohol and child welfare policies).

7. **Merritt, E. L., Burduli, E., Purath, J., & Smart, D. (2022). Health Care Professionals' Perceptions of Caring for Patients with Substance Use Disorders during Pregnancy. *The American Journal of Maternal Child Nursing*, 47(5), 288–293. <https://doi.org/10.1097/NMC.0000000000000843>**

This US study explored health care professionals' perceptions of caring for pregnant women with substance use disorders (SUDs) before and after attending a conference where information and education on the complex needs of pregnant women with SUDs was provided. Health care professionals took an adapted version of the Attitudes of Healthcare Providers survey. There was an increase in health care providers knowledge and competence scores following the educational conference, but these were not sustained over time. The authors purport that sustained attitude change requires access to additional clinical and community resources beyond educational sessions and highlight that improvements in care are facilitated by reducing stigma and implicit biases towards pregnant women with SUDs.

8. **Richelle, L., Dramaix-Wilmet, M., Roland, M., Kacenelenbogen, N. (2022). Factors influencing medical students' attitudes towards substance use during pregnancy. *BMC Medical Education*, 22(1):335. <https://doi.org/10.1186/s12909-022-03394-8>**

This Belgian study surveyed medical students in their final year about their attitudes about substance use during pregnancy. A total of $n = 370$ students responded to the survey. 19.2% favoured punishing alcohol use and 15.1% favoured punishing drug use during pregnancy. Students were more in favour of punishment if they were men, older, their mothers had a lower level of education, or if there was no personal or family history of substance use. Further, attitudes were more punitive amongst those with limited contact with people with substance use disorders and those in maternal medicine. Further awareness and training are needed among medical students to ensure adequate care and support.

9. **Tappin, D., Mackay, D., Reynolds, & Fitzgerald, N. (2022). Minimizing sample bias due to stigmatized behaviours: The representativeness of participants in a cohort study of alcohol in pregnancy. *BMC Medical Research Methodology*, 22, 138. <https://doi.org/10.1186/s12874-022-01629-2>**

This UK study examined the use of passive consent to minimize bias and stigma towards women who use alcohol during pregnancy. Women participating in a midwife-led pregnancy support program in 2017-2018 were sent a Patient Information Sheet informing them an additional blood draw might be taken at their next appointment (with the option to opt out). The sample was tested for an alcohol biomarker, but neither women nor midwives were informed of the specific test. 85% of woman provided the blood sample. Women who did not consent to the additional sample were significantly younger ($p < 0.001$), less affluent ($p < 0.001$), and less likely to need intervention based on self-reported alcohol use. There were no other significant differences between the two groups from other data collected. The use of passive consent without disclosure of the research focus/sample provision led to a high rate of participation, making this sample more representative of the general population. This research shows the value of passive consent in studies where stigma and bias may otherwise present.

10. **Winter, G. F. (2022). Fetal alcohol screening and ethics. *British Journal of Midwifery*, 30(6).**

This commentary explores the moral and clinical paradigms that influence guidance on alcohol use during pregnancy and emphasizes the importance of adopting a public health approach that is based in evidence on alcohol use in pregnancy, rather than moral values.

11. **Wolfson, L., Poole, N., Harding, K. D., & Stinson, J. At a Juncture: Exploring Patterns and Trends in FASD Prevention Research from 2015 – 2021 Using the Four-Part Model of Prevention. *Journal of Fetal Alcohol Spectrum Disorder*, 4(SP1), e36–e59. <https://doi.org/10.22374/jfasd.v4iSP1.13>**

See above (Prevalence of, and influences and factors associated with, alcohol use in pregnancy).

12. **Yaesoubi, R., Mahin, M., Martin, G., Paltiel, A. D., & Sharifi, M. (2022). Reducing the prevalence of alcohol exposed pregnancies in the United States: A simulation modeling study. *Medical Decision Making*, 42(2), 2017 – 227. <https://doi.org/10.1177/0272989X211023203>**

The aim of this US study was to simulate a cohort of pregnant women to determine the risks for alcohol-exposed pregnancies (AEPs) based on individual behaviour under different public health strategies. Through the simulation, the authors estimated that 54% of pregnancies in the US are alcohol exposed, with 12% exposed to ≥ 5 drinks per week and 3% exposed to ≥ 9 drinks per week. The authors further estimated that 80% of unintended pregnancies are unknowingly alcohol exposed. The authors project that public health efforts that focus only on promoting alcohol abstinence among women who are aware of their pregnancy or seeking pregnancy could reduce the prevalence of AEPs by at most 42% (36–48%). Augmenting this strategy with efforts to avert unintended pregnancies could yield an 80% (73–86%) reduction in the prevalence of AEPs. As such the authors conclude that programs to avert unintended pregnancies, in addition to programs that promote alcohol abstinence among women who are aware of their pregnancy, are essential to achieve more substantial reductions in AEPs in the US.

Summary of Included Studies by Method and Country of Study

Table 2: Included studies by method, country and page number

#	Author	Title	Method	Country	Page
Prevalence of, and influences and factors associated with, drinking in pregnancy					
n = 38	Abetew et al.	Alcohol consumption and its determinants among pregnant women in Gozamin district, Amhara, Ethiopia, 2020	Cross sectional	Ethiopia	5
	Adeoye	Alcohol consumption and tobacco exposure among pregnant women in Ibadan, Nigeria	Cross sectional	Nigeria	5
	Adiri et al.	Perception of safety and consumption of alcoholic beverages during pregnancy	Cross sectional	Nigeria	5
	Allen et al.	Pregnant and early parenting Indigenous women who use substances in Canada: A scoping review of health and social issues, supports, and strategies	Scoping review	Canada	5
	Corrales-Gutierrez et al.	Relationship between Eating Habits, Physical Activity and Tobacco and Alcohol Use in Pregnant Women: Sociodemographic Inequalities	Cross sectional	Spain	6
	Daggy et al.	The Impact of Self-Reported Alcohol, Tobacco, and Recreational Drug Use during Pregnancy on Adverse Pregnancy Outcomes in First-Time Mothers	Cross sectional	US	6
	Demeke & Bayu	Assessment of alcohol utilization during pregnancy and its associated factors among reproductive women in Mecha Woreda of North Western Ethiopia	Cross sectional	Ethiopia	6
	Dewey et al.	"I was already in the system from the start": How substance-using women in the street sex trade make decisions about pregnancy	Qualitative	US	7
	Duko et al.	The Prevalence of Alcohol Consumption Among Pregnant Women in Ethiopia: A Systematic Review and Meta-Analysis	Systematic review and meta-analysis	Ethiopia	7
	Erdenetuya et al.	Alcohol use during pregnancy: findings from a gender-based violence survey in Mongolia	Cross sectional	Mongolia	7
	Fletcher et al.	Perceptions of two different alcohol use behaviours in pregnancy: an application of the prototype/willingness model	Cross sectional	UK	7
	Greaves et al.	Sex, gender and alcohol use: Implications for women and low-risk drinking guidelines	Review	Canada	8
	Hammer & Rapp	Women's views and experiences of occasional alcohol consumption during pregnancy: A systematic review of qualitative studies and their recommendations	Systematic review	Switzerland	8
	Hemady et al.	Patterns of adverse childhood experiences and associations with prenatal substance use and poor infant outcomes in a multi-country cohort of mothers: a latent class analysis	Cross sectional	UK, Philippines, Vietnam, Pakistan, Romania, South Africa, Ghana, Jamaica	8
	Hernandez et al.	Alcohol use and problems among Latinas at risk of an alcohol-exposed pregnancy: The role of acculturation and interpersonal factors	Cross sectional	US	8
	Hirth et al.	Racial/ethnic variations in alcohol and cigarette use by pregnancy status among 20- to 44-year-old women, NHANES 2001 – 2018	Cross sectional	US	9
	Howard et al.	Trends in Binge Drinking and Heavy Alcohol Consumption Among Pregnant Women in the US, 2011 to 2020	Cross sectional	US	9
	Hutchinson et al.	Longitudinal prediction of periconception alcohol use: A 20-year prospective study across adolescence, young adulthood, and pregnancy	Cohort	Australia	9
	Kassaw et al.	Spatial distribution and determinants of alcohol consumption among pregnant women in Ethiopia: Spatial and multilevel analysis	Cross sectional	Ethiopia	10
	Kim	Exploring the Patterns of Substance Use Behaviors in a Nationally Representative Sample of Pregnant Women: A Latent Class Approach	Cross sectional	US	10

	Kloss et al.	Dietary Intake Patterns and Lifestyle Behaviors of Pregnant Women Living in a Manitoba First Nations Community: Implications for Fetal Alcohol Spectrum Disorder	Cross sectional	Canada	10
	Kotelnikova	Prevalence of self-reported alcohol consumption among pregnant women in Russia between 1994 and 2018	Cross sectional	Russia	11
	Maas et al.	Planning is not equivalent to preparing, how Dutch women perceive pregnancy planning in relation to preconception lifestyle behaviours: A cross-sectional study	Cross sectional	The Netherlands	11
	Marangoni et al.	Consumption Of Drugs of Abuse During Pregnancy Analyzed by Means of the Opportunistic Screening Method	Cross sectional	Brazil	11
	May et al.	The prevalence of fetal alcohol spectrum disorders in rural communities in South Africa: A third regional sample of child characteristics and maternal risk factors	Case control	South Africa	11
	Muggli et al.	A data driven approach to identify trajectories of prenatal alcohol consumption in an Australian population-based cohort of pregnant women	Cross sectional	Australia	12
	Mulat et al.	Alcohol use during pregnancy and associated factors among pregnant women in Sub-Saharan Africa: further analysis of the recent demographic and health survey data	Cross sectional	Burundi, Ethiopia, Liberia, Zimbabwe	12
	Ndanga et al.	Trend analysis of substance use disorder during pregnancy	Case control	US	12
	Page et al.	Prevalence of marijuana use in pregnant women with concurrent opioid use disorder or alcohol use in pregnancy	Cohort	US	13
	Pehlke-Milde et al.	Women's views on moderate and low alcohol consumption: Stages of the subjective transition from pregnancy to postpartum	Qualitative	Switzerland	13
	Peltier et al.	Licit and illicit drug use across trimesters in pregnant women endorsing past-year substance use: Results from National Survey on Drug Use and Health (2009-2019)	Cross sectional	US	13
	Popova et al.	Why do women consume alcohol during pregnancy or while breastfeeding?	Systematic review	Canada, UK	13
	Rawoot et al.	Barriers and facilitators of alcohol abstinence during pregnancy	Qualitative	South Africa	14
	Sánchez et al.	Facilitators and barriers to substance-free pregnancies in high-income countries: A meta-synthesis of qualitative research	Meta-analysis	Ireland	14
	Shafique et al.	Preconception Substance Use and Risk of Unintended Pregnancy: Pregnancy Risk Assessment Monitoring System 2016-17	Cross sectional	US	14
	Tsang et al.	Predictors of alcohol use during pregnancy in Australian women	Cross sectional	Australia	15
	Wolfson et al.	At a Juncture: Exploring Patterns and Trends in FASD Prevention Research from 2015 - 2021 Using the Four-Part Model of Prevention	Review	Canada	15
	Young-Wolff et al.	Association of Pregnancy Intentions with Substance Use During Early Pregnancy	Cross sectional	US	15
Level 1 Prevention					
n = 12	Heenan et al.	Influencing and implementing mandatory alcohol pregnancy warning labels in Australia and New Zealand	Editorial	Australia	16
	Jacobsen et al.	The universal and primary prevention of Foetal Alcohol Spectrum Disorders (FASD): A systematic review	Systematic Review	Germany	16
	Lacoste-Badie et al.	Improving the effectiveness of pregnancy warning labels displayed on alcohol containers: a French eye-tracking study	Within-subject experiment	France	16
	Lemon et al.	Vision, future, cycle and effect: A community life course approach to prevent prenatal alcohol exposure in central Australia	Qualitative	Australia	16
	Maas et al.	The effect of a locally tailored intervention on the uptake of preconception care in the Netherlands: a stepped-wedge cluster randomized trial (APROPOS-II study)	Randomized controlled trial	The Netherlands	17
	McQuire et al.	Prenatal alcohol prevention in the UK: mapping the landscape through systematic collaborative review	Systematic Review	UK	17
	Millot et al.	How the alcohol industry fought against pregnancy warning labels in France. A press coverage analysis spanning 20 years	Qualitative	France	17

	Okulicz-Kozaryn	Is Public Health Response to the Phenomenon of Alcohol Use during Pregnancy Adequate to the Polish Women's Needs?	Analysis	Poland	18
	Pettigrew et al.	Evaluation outcomes of an alcohol and pregnancy campaign targeting multiple audiences.	Cross sectional	Australia	18
	Schölin & Heenan	No Alcohol, No Risk. #FASD"- Twitter Activity on Alcohol and Pregnancy among Australian Organizations".	Qualitative	Australia	18
	Tsang et al.	Written information and health professionals are the information sources about alcohol use in pregnancy most often used by pregnant women	Cross sectional	Australia	18
	Wolfson et al.	At a Juncture: Exploring Patterns and Trends in FASD Prevention Research from 2015 - 2021 Using the Four-Part Model of Prevention	Review	Canada	15
Level 2 Prevention					
n = 31	Agiresaasi et al.	Effect of a communication intervention on alcohol use during pregnancy in post conflict Northern Uganda: a quasi-experimental study	Quasi-experimental	Uganda	19
	Arkell et al.	Using meconium to establish prenatal alcohol exposure in the UK: Ethical, legal, and social considerations	Commentary	UK	19
	Bennett & Bowden	Can routine screening for alcohol consumption in pregnancy be ethically and legally justified?	Editorial	UK	19
	Ceci et al.	Urinary ethyl glucuronide for the assessment of alcohol consumption during pregnancy: Comparison between biochemical data and screening questionnaires	Cross sectional	Italy	19
	Chanal et al.	Use of psychoactive substances during the perinatal period: guidelines for interventions during the perinatal period from the French National College of Midwives	Guidelines	France	20
	Doherty et al.	Practice change intervention to improve antenatal care addressing alcohol consumption during pregnancy: a randomised stepped-wedge controlled trial	Randomized controlled trial	Australia	20
	Dray et al.	Enhancing clinician participation in quality improvement training: implementation and impact of an evidence-based initiative to maximise antenatal clinician participation in training regarding women's alcohol consumption during pregnancy	Analysis	Australia	20
	Everitt et al.	Educational programs and teaching strategies for health professionals responding to women with complex perinatal mental health and psychosocial concerns: A scoping review	Scoping review	Australia	21
	Gimenez et al.	Efficacy of Brief Intervention for Alcohol Consumption during Pregnancy in Argentinean Women: A Randomized Controlled Trial	Randomized controlled trial	Argentina	21
	Hanson et al.	Adaptations of an RCT during COVID: Case Study in one Rural American Indian Community	Brief report	USA	21
	Hen-Herbst et al.	Nutritionists' practices and knowledge about the risks of alcohol consumption during pregnancy: An Israeli survey	Cross sectional	Israel	21
	Hwang et al.	Time to promote the awareness of unhealthy alcohol use among women	Editorial	US	22
	Jacobsen et al.	The universal and primary prevention of Foetal Alcohol Spectrum Disorders (FASD): A systematic review	Systematic Review	Germany	16
	Maas et al.	The effect of a locally tailored intervention on the uptake of preconception care in the Netherlands: a stepped-wedge cluster randomized trial (APROPOS-II study)	Randomized controlled trial	The Netherlands	17
	Marcellus et al.	Developments in Nursing Practice to Address Substance Use in the Perinatal Period	Commentary	Canada, US, Australia	22
	McQuire et al.	Prenatal alcohol prevention in the UK: mapping the landscape through systematic collaborative review	Systematic Review	UK	17
	Montanaro et al.	Validating PreCHAT: A Digital Preconception Health Risk Assessment Tool to Improve Reproductive, Maternal and Child Health	Criterion validation	Canada	22
	Morrello et al.	"Now, with a bit more knowledge, I understand why I'm asking those questions." Midwives' perspectives on their role in the Greater Manchester health and social care partnership's programme to reduce alcohol exposed pregnancies"	Qualitative	UK	23
	Oh et al.	Effectiveness of Digital Interventions for Preventing Alcohol Consumption in Pregnancy: Systematic Review and Meta-analysis	Systematic review and meta-analysis	Korea	23

	Olusanya et al.	Midwives' knowledge and perceived barriers to screening alcohol use among pregnant women in a southwestern US state	Cross sectional	US	23
	Oni et al.	Barriers to women's disclosure of and treatment for substance use during pregnancy: A qualitative study	Qualitative	Australia	24
	Perkes et al.	Development of a Maternal and Child mHealth Intervention with Aboriginal and Torres Strait Islander Mothers: Co-design Approach	Qualitative	Australia	24
	Renbarger et al.	Provider Characteristics Associated with Trust When Caring for Women Experiencing Substance Use Disorders in the Perinatal Period	Systematic Review	US	24
	Sapru et al.	Evaluating Partnerships for Practice Change in the Prevention, Identification, and Treatment of Fetal Alcohol Spectrum Disorders	Mixed methods	US	24
	Silverio et al.	'People still want a face and that's where we can fill in': A qualitative study of community pharmacists' experiences of providing healthcare advice about preconception and pregnancy	Qualitative	UK	25
	Szewczyk et al.	Cost, cost-consequence and cost-effectiveness evaluation of a practice change intervention to increase routine provision of antenatal care addressing maternal alcohol consumption	Clinical trial	Australia	25
	Trocin et al.	Patient perceptions of three substance use screening tools for use during pregnancy	Qualitative	US	25
	Tsang et al.	Written information and health professionals are the information sources about alcohol use in pregnancy most often used by pregnant women	Cross sectional	Australia	18
	Tsang et al.	Effectiveness of a practice change intervention in reducing alcohol consumption in pregnant women attending public maternity services	Clinical Trial	Australia	26
	Withanage et al.	Effectiveness of preconception interventions in primary care: a systematic review	Systematic review	Australia	26
	Wolfson et al.	At a Juncture: Exploring Patterns and Trends in FASD Prevention Research from 2015 - 2021 Using the Four-Part Model of Prevention	Review	Canada	15
Level 3 Prevention					
n = 13	Bray et al.	MIRRORS program: Helping pregnant and postpartum women and families with substance use problems	Cross sectional	US	27
	Choi et al.	Differential Gateways, Facilitators, and Barriers to Substance Use Disorder Treatment for Pregnant Women and Mothers: A Scoping Systematic Review	Scoping Review	US	27
	Chou et al.	Residential substance use treatment outcomes for pregnant and postpartum women: Distinct patterns for women enrolled before versus during the COVID-19 pandemic	Case control	US	27
	Courchesne-Krak et al.	"Differences in outpatient, emergency, and inpatient use among pregnant women with a substance-related diagnosis."	Case control	US	28
	Flannigan et al.	Complementary therapies in substance use recovery with pregnant women and girls	Mixed methods	US	28
	Jones et al.	Increasing knowledge about recovery-related life domains among pregnant and parenting women in comprehensive substance use disorder treatment: The Art of Addiction Recovery Program	Before and after	US	28
	Hodges et al.	Associations of Mental Health Measures and Retention in a Community-Based Perinatal Care Recovery Support Program for Women of Childbearing Age With Substance Use Disorder	Cross sectional	US	29
	McKinney et al.	A Comprehensive Care Approach for Pregnant Persons with Substance Use Disorders	Commentary	US	29
	Newell et al.	Virtual Peer Support in Women's Health for Pregnant People and Mothers With Substance Use Disorder	Before and after	US	30
	Palacios et al.	Accompaniment process, gender focus, and women in alcohol/drug consumption in pregnancy and motherhood: Transdisciplinary keys and occupational therapies from the south	Qualitative	Chile	30

	Smith et al.	Implementation barriers and enablers of midwifery group practice for vulnerable women: a qualitative study in a tertiary urban Australian health service	Qualitative	Australia	30
	West et al.	Evaluation of interprofessional training to strengthen communication and coordination among providers working with expectant mothers and infants affected by substance use.	Before and after	US	30
	Wolfson et al.	At a Juncture: Exploring Patterns and Trends in FASD Prevention Research from 2015 – 2021 Using the Four-Part Model of Prevention	Review	Canada	15
Level 4 Prevention					
n = 13	Bray et al.	MIRRORS program: Helping pregnant and postpartum women and families with substance use problems	Cross sectional	US	27
	Choi et al.	Differential Gateways, Facilitators, and Barriers to Substance Use Disorder Treatment for Pregnant Women and Mothers: A Scoping Systematic Review	Scoping Review	US	27
	Chou et al.	Residential substance use treatment outcomes for pregnant and postpartum women: Distinct patterns for women enrolled before versus during the COVID-19 pandemic	Case control	US	27
	Dauber et al.	Adaptive Text Messaging for Postpartum Risky Drinking: Conceptual Model and Protocol for an Ecological Momentary Assessment Study	Conceptual model	US	31
	Hodges et al.	Associations of Mental Health Measures and Retention in a Community-Based Perinatal Care Recovery Support Program for Women of Childbearing Age with Substance Use Disorder	Cross sectional	US	29
	Ingalls et al.	Towards precision home visiting: results at six months postpartum from a randomized pilot implementation trial to assess the feasibility of a precision approach to Family Spirit	Randomized controlled trial	US	32
	Jones et al.	Increasing knowledge about recovery-related life domains among pregnant and parenting women in comprehensive substance use disorder treatment: The Art of Addiction Recovery Program	Before and after	US	28
	Kanda et al.	Does customised care improve satisfaction and positively enable parents in sustained home visiting for mothers and children experiencing adversity?	Randomized controlled trial	Australia	32
	Kanda et al.	Variations in sustained home visiting care for mothers and children experiencing adversity	Randomized controlled trial	Australia	33
	Newell et al.	Virtual Peer Support in Women's Health for Pregnant People and Mothers with Substance Use Disorder	Before and after	US	30
	Palacios et al.	Accompaniment process, gender focus, and women in alcohol/drug consumption in pregnancy and motherhood: Transdisciplinary keys and occupational therapies from the south	Qualitative	Chile	30
	Tsantefski et al.	Sustainable social networks for mothers in recovery: The mirror families model	Mixed methods	Australia	33
	Wolfson et al.	At a Juncture: Exploring Patterns and Trends in FASD Prevention Research from 2015 – 2021 Using the Four-Part Model of Prevention	Review	Canada	15
Supportive Alcohol and Child Welfare Policy					
n = 12	Adebiyi & Mukumbang	Alcohol ban during the COVID-19 pandemic lockdown: Lessons for preventing foetal alcohol spectrum disorder in South Africa	Commentary	South Africa	34
	Deutsch et al.	Equitable policies need equitable practices: Alcohol- and substance-exposed pregnancy as a case study	Commentary	US	34
	Deutsch et al.	Impact of plans of safe care on prenatally substance exposed infants	Retrospective	US	34
	Finlay-Jones et al.	It takes a village: Influencing policy and practice to prevent alcohol use in pregnancy and promote better outcomes for individuals living with Fetal Alcohol Spectrum Disorder.	Practice paper	Australia	34
	Heenan et al.	Influencing and implementing mandatory alcohol pregnancy warning labels in Australia and New Zealand	Editorial	Australia	15
	Lee et al.	Beyond 'the choice to drink' in a UK guideline on FASD: the precautionary principle, pregnancy surveillance, and the managed woman	Discourse analysis	UK	35

	Kenny et al.	Responses to prenatal opioid and alcohol abuse: A review of US and Australian mandatory reporting laws	Review	Australia, US	35
	Harmsen van der Vliet-Torji et al.	Development of a Blueprint for Integrated Care for Vulnerable Pregnant Women	Policy paper	The Netherlands	35
	Maclean et al.	Prenatal substance use policies and infant maltreatment reports	Cross sectional	US	35
	Roberts et al.	Health care provider decision-making around prenatal substance use reporting	Qualitative	US	36
	Smith et al.	Questioning policy representations of women's alcohol consumption: Implications for social work	Discourse analysis	Australia	36
	Wolfson et al.	At a Juncture: Exploring Patterns and Trends in FASD Prevention Research from 2015 – 2021 Using the Four-Part Model of Prevention	Review	Canada	15
Other – stigma, ethical issues, and systemic approaches					
<i>n = 13</i>	Binder et al.	Researching Alcohol Consumption During Pregnancy. Opportunities and Challenges with Two Methods of Data Acquisition	Qualitative	Germany	36
	Bright et al.	Stigma experienced by rural pregnant women with substance use disorder. A scoping review and qualitative synthesis	Scoping review	US	37
	Choate et al.	The alcohol industry and social responsibility: Links to FASD	Commentary	Canada, Australia	37
	Culp et al.	Understanding Alcohol Use Discourse and Stigma Patterns in Perinatal Care on Twitter	Qualitative	US	37
	Harding et al.	"You don't want to drink? What are you, pregnant?!" Portrayals of alcohol and substance use during pregnancy on television	Qualitative	Canada	37
	Lee et al.	Beyond 'the choice to drink' in a UK guideline on FASD: the precautionary principle, pregnancy surveillance, and the managed woman	Discourse analysis	UK	35
	Merritt et al.	Health Care Professionals' Perceptions of Caring for Patients with Substance Use Disorders during Pregnancy	Cross sectional	US	38
	Richelle et al.	Factors influencing medical students' attitudes towards substance use during pregnancy	Cross sectional	Belgium	38
	Tappin et al.	Minimizing sample bias due to stigmatized behaviours: The representativeness of participants in a cohort study of alcohol in pregnancy	Cohort	UK	38
	Winter	Fetal alcohol screening and ethics	Commentary	UK	38
	Wolfson et al.	At a Juncture: Exploring Patterns and Trends in FASD Prevention Research from 2015 – 2021 Using the Four-Part Model of Prevention	Review	Canada	15
	Yaesoubi et al.	Reducing the prevalence of alcohol exposed pregnancies in the United States: A simulation modeling study	Simulation modelling study	US	39

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