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Perinatal Psychoactive Substance Use Among Indigenous Women: Social Determinants

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KNOWLEDGE SYNTHESIS

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FOREWORD

This production stems from a mandate given within the framework of the Government Action Plan for the Social and Cultural Development of the First Nations and Inuit 2017 : Do more, better (2017–2022). The Direction des affaires autochtones of the Ministère de la Santé et des Services sociaux (MSSS) has mandated the Institut national de santé publique du Québec (INSPQ) to carry out a project on the use of psychoactive substances (PAS) during the perinatal period among Indigenous women. The first phase of this project, a knowledge synthesis of the social determinants of perinatal PAS use among Indigenous women, is presented in this document. The project was developed in support of the following measures in the plan:

1.1.24 Inform and heighten awareness among pregnant women, those who wish to become pregnant and their family circle concerning the risks linked to psychoactive substances;

4.1.1 Implement activities that promote the transfer of knowledge pertaining to addiction in the First Nations and Inuit communities;

4.2.7 Take stock of knowledge on addiction problems in First Nations and Inuit communities;

4.2.8 Determine possible applications of the information inventoried with respect to addiction treatment in First Nations and Inuit communities;

4.2.9 Conduct research on targeted themes according to the need for knowledge on addiction in First Nations and Inuit communities.

Measure 1.1.24 was prioritized by the MSSS in response to the Calls to Action launched by the Truth and Reconciliation Commission of Canada. This Commission raised the importance of prevention of fetal alcohol spectrum disorder and the development of prevention programs adapted to the various Indigenous realities.

This knowledge synthesis precedes a second one on the prevention of perinatal PAS use among Indigenous women.

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GLOSSARY

Indigenous health

Indigenous: According to the United Nations Permanent Forum on Indigenous Issues, a formal and universal definition of the concept of Indigenous peoples would lead to the prioritization of some characteristics over others (Department of Economic and Social Affairs of the United Nations Secretariat, 2009). In addition, Article 33.1 of the United Nations (UN) Declaration on the Rights of Indigenous Peoples emphasizes the right of Indigenous peoples to "determine their own identity or membership in accordance with their customs and traditions. This does not impair the right of indigenous individuals to obtain citizenship of the States in which they live." (UN, 2007).

In Canada, "Indigenous" is a legal term used to define the first peoples who inhabited the territory before the arrival of European settlers and their descendants.
The Constitution Act of 1982 recognizes three distinct peoples: First Nations (with or without status), the Inuit, and the Métis.

In Québec, no historic Métis community has been legally and politically recognized. The term "Indigenous" therefore refers to the ten First Nations and the Inuit.
These First Nations are the Abenaki, Anishinaabe, Atikamekw, Cree, Huron-Wendat, Innu, Maliseet, Mi'kmaq, Mohawk, and Naskapi.

Indigenous community: Designates a territory inhabited by a group of people who recognize a familial, cultural, and historical belonging to an Indigenous nation. In Canada, Indigenous communities were established during waves of settlement and, for the majority, were legally established by federal authorities as reserves under the Indian Act (Bergeron et al., 2018).

Cultural continuity: Closely linked to family and intergenerational ties, it reflects the degree of social and cultural cohesion in a community. It stems from the strength of family ties, but also from the intergenerational transmission of traditions, language, culture, and spirituality. Conversely, acculturation is related to a break with traditional language, culture, and spirituality (Reading & Wien, 2009).

Discrimination: A distinction, exclusion, or preference related to ethnocultural origin, skin colour, sex, gender identity or expression, pregnancy, sexual orientation, marital status, age (except as provided by law), religion, political beliefs, language, social condition, disability, or the use of a means to accommodate that disability (MSSS, 2021).

Social determinants of health: Refers to the personal, social, economic, and environmental factors that influence a population's health status. These are the circumstances in which people are born, grow up, live, work, and age, such as the health care and educational systems available to them. In turn, these circumstances depend on a set of broader forces: the economy, social policies, and politics. Social determinants are inequitably distributed across different levels of society, thereby creating health inequalities (World Health Organization Commission on Social Determinants of Health, 2016).

Residential schools: A system of federally administered and funded religious schools established around 1840. The goal of the residential school system was to convert Indigenous children to Christianity while at the same time erasing their history, culture, and identity. The last residential school closed in 1996 (Smylie, 2013). Some 150,000 First Nations, Inuit, and Métis children attended these institutions where poor sanitation, overcrowding, and physical and sexual abuse were reported (Smylie, 2013).

Native Americans and Alaska Natives: A person with origins in any of the native peoples of North and South America (including Central America) who maintains a tribal affiliation or community attachment (National Congress of American Indians, 2020), often abbreviated "AI/AN".

Psychoactive substance use

Addiction: Psychoactive substance use is a spectrum. Addiction is a moderate to severe form of an alcohol- or other psychoactive substance use disorder. It is characterized by an uncontrollable urge to use a substance, even if the person wants to stop or reduce their use because of the impact on their life (Canadian Centre on Substance Use and Addiction, 2009). Use becomes necessary after a variable amount of time and may cause tolerance, the need to use more to have the same effect, or withdrawal symptoms if use is stopped (Chansonneuve, 2007).

Psychoactive substances: There are three main categories of psychoactive substances, classified according to their effects on the central nervous system: disruptive substances (e.g., cannabis, ecstasy), depressants (e.g., alcohol, opioids), and stimulants (e.g., cocaine, amphetamine) (Government of Québec, 2017).

Fetal alcohol spectrum disorder: A diagnostic term encompassing the effects of prenatal alcohol exposure. Alcohol is known to disrupt a baby's development during pregnancy. It can affect the development of the brain and the central nervous system, leading to problems with attention, memory, behaviour, or learning and also physical health problems such as delayed growth (Masella, 2021).

ABBREVIATIONS AND ACRONYMS

CCAT	Crowe Critical Appraisal Tool
CERP	Commission d'enquête sur les relations entre les Autochtones et certains services publics [Public Inquiry Commission on relations between Indigenous Peoples and certain public services in Québec]
FASD	Fetal alcohol spectrum disorder
FNQLHSSC	First Nations of Quebec and Labrador Health and Social Services Commission
INSPQ	Institut national de santé publique du Québec
MMIWG	National Inquiry into Missing and Murdered Indigenous Women and Girls
MSSS	Ministère de la Santé et des Services sociaux
PAS	Psychoactive substances
RCAAQ	Regroupement des centres d'amitié autochtones du Québec
RHS	First Nations Regional Health Survey
TRC	Truth and Reconciliation Commission of Canada

HIGHLIGHTS

Because of its impact on the health of families and future generations, psychoactive substance use during the perinatal period is a public health concern for the entire population. Understanding the factors that influence psychoactive substance use among Indigenous women in the perinatal period is essential to targeting prevention and health and wellness promotion strategies for First Nations and Inuit people. This synthesis analyzes the factors that emerge from the scientific literature through the lens of social determinants of health.

- Strong family ties, social support and connection to community, traditional values and culture emerged as protective factors against psychoactive substance use during the perinatal period for Indigenous women. These factors are associated with the social environment and cultural continuity, which are social determinants of Indigenous health.
- Difficult living conditions (job insecurity, low education level, and frequent relocation) and interpersonal violence tend to increase psychoactive substance use among Indigenous women before, during, and after pregnancy. These social determinants are also influenced by health and educational systems, as well as by historical and political contexts.
- Based on the results of the selected publications, the relationship between well-being and mental health and psychoactive substance use during the perinatal period needs to be considered. Indigenous women who feel depressed are more likely to use psychoactive substances during the perinatal period.
- Although few studies in this synthesis address this issue, the historical trauma experienced by Indigenous peoples has implications for the health and well-being of Indigenous women and communities. In particular, it influences psychoactive substance use behaviours and addiction problems. Some women attribute their adverse childhood experiences to the historical trauma experienced by Indigenous peoples.
- The cessation or reduction of psychoactive substance use during the perinatal period is influenced by several social determinants. Improving Indigenous peoples' living conditions, building supportive social environments, and ensuring cultural continuity—in close collaboration with Indigenous authorities—are avenues for action on these determinants.

SUMMARY

Context

During pregnancy, alcohol use is the leading cause of birth defects; the effects of alcohol on the child are variable and permanent. Furthermore, psychoactive substance use (PAS) within a parental context is linked to a lack of positive attachment patterns and the erosion of support and sharing networks. The negative impacts of PAS use during the perinatal period on women's and children's health make this an important public health issue. In Québec, as elsewhere in Canada, significant social inequalities in health are observed among Indigenous people and are reflected, among other things, in high levels of PAS use, which sometimes occurs during the perinatal period.

According to data from the 2015 First Nations Regional Health Survey, nearly one in ten children under the age of five was born to a mother who drank alcohol during her pregnancy. In the 2017 *Qanuilirpitaa?* survey in Nunavik, approximately two out of ten Inuit women reported drinking alcohol during their last pregnancy.

Indigenous women face significant barriers to optimal health and well-being, including sexism, violence, and poverty. The context of perinatality and the changes accompanying motherhood add to the different realities of Indigenous women. Understanding the social determinants that influence perinatal PAS use is essential to targeting prevention and health and wellness promotion strategies for First Nations and Inuit people.

Objectives

To better understand the social determinants of perinatal PAS use among Indigenous women, a knowledge synthesis was conducted.

It had three objectives:

- Identify the social determinants of perinatal PAS use among Indigenous women.
- Analyze the relationships between different social determinants.
- Suggest relevant courses of action in accordance with the scientific findings identified.

Methodology

A literature review was conducted in the scientific and grey literature to extract a relevant set of publications. For this synthesis, PAS use refers primarily to alcohol use, but also to drug use (e.g., cannabis). In addition, the perinatal period begins from the planning of the pregnancy or conception until the child's first birthday.

The selection, based on precise criteria, led to a list of 15 publications (14 scientific articles and one book chapter). The scientific quality of the publications was assessed using the Crowe Critical Appraisal Tool. An extraction grid was used to identify the relevant characteristics and findings of the selected publications.

Publications were analyzed thematically. This is based on the Integrated Life Course and Social Determinants Model of Aboriginal Health developed by the National Collaborating Centre for Indigenous Health. This conceptual framework presents the physical, emotional, mental, and spiritual dimensions of health influenced by a multitude of social determinants. In this framework, used for deductive analysis, determinants are classified into three categories: proximal, intermediate, and distal. An inductive approach completes the analysis to include relevant findings related to social determinants absent from the framework.

Table 1 Social determinants related to relevant findings in selected publications: a summary

Proximal determinates Closely related to daily life, they influence the ability of individuals to meet their basic needs.	Employment and income Education Consumption habits Interpersonal violence* Mental health and well-being* Physical environments
Intermediate determinants Influence proximal determinants.	Cultural continuity Social environment* Health care systems
Distal determinants Political, economic, and social contexts that construct intermediate and proximal determinants.	Colonialism

* Inductive social determinants

Results

Alcohol use during pregnancy: the subject of most studies

The authors of seven publications focus exclusively on PAS use during pregnancy and not on use during the year after childbirth. In the corpus, alcohol is a PAS studied in all of the publications. The authors frequently group different types of drugs together for analysis.

Social environment and cultural continuity: protective factors

Strong social support and family ties emerged as protective factors against PAS use during the perinatal period. Also, connection to community, traditional values, and culture can help reduce or stop PAS use during pregnancy. These factors are linked to the social environment and cultural continuity, which are social determinants of Indigenous health.

Use influenced by difficult living conditions

In the selected publications, proximal determinants are the most frequently studied: employment, income, education, and housing. The links between the living conditions of Indigenous women and PAS use during the perinatal period are highlighted by a majority of authors. Indigenous women are more likely than non-Indigenous women to live in adverse conditions such as poverty, food insecurity, or overcrowded housing.

In addition, the authors of nine publications point to the negative effects of adverse childhood experiences and interpersonal violence on Indigenous women's use of PAS in general and during the perinatal period.

Finally, in light of the results of the selected publications, the relationship between well-being and mental health and PAS use during the perinatal period should be considered. Indigenous women who are more depressed are more likely to use PAS during the perinatal period.

Considering historical and political contexts when analyzing health behaviours

Although few studies in this synthesis address this issue, the historical trauma experienced by Indigenous peoples and its intergenerational transmission have adverse effects on the health and well-being of individuals, families, and communities. Indeed, historical events and government policies have led to social and cultural upheavals.

Proximal determinants alone do not provide a complete picture of all the social determinants influencing PAS use before, during, and after the perinatal period. Also, they do not account for the multiple facets of the experience of motherhood and its particularities for each Indigenous nation.

Courses of action

Three courses of action emerge from the findings and analysis of the selected publications. These proposals can be a starting point for future research or prevention activities.

Improve the living conditions of Indigenous peoples, particularly Indigenous women

One way to reduce or stop PAS use by Indigenous women is to improve their living conditions (employment, housing, and education). Interventions to improve living conditions must reflect the diverse realities of Indigenous people and be tailored to their needs.

Consider all the social determinants of psychoactive substance use with a focus on cultural safety and self-determination

Taking into account all of the social determinants broadens the understanding of PAS use by incorporating notions of well-being. Historical trauma impacts the health, well-being, and PAS use behaviours of Indigenous women. Furthermore, depressed Indigenous women are more likely to use PAS during the perinatal period. Approaches developed for non-Indigenous women are not always appropriate, safe, or effective for Indigenous women. Thus, cultural safety in care should be prioritized in perinatal follow-ups and in all interactions with the health care system and services. In addition, self-determination, a distal determinant of Indigenous health, is essential to ensure the appropriateness of health care and services, as well as prevention.

Increase scientific knowledge and evaluate the effectiveness of prevention efforts

Additional research on intermediate and distal social determinants could provide concrete targets for interventions to support Indigenous women. In addition, Indigenous notions of health and well-being, motherhood and childbearing, or personal responsibilities and freedoms are given little or no attention in the selected publications. Examining them would sharpen our understanding of the mechanisms of protective factors. Finally, activities to prevent PAS use in the perinatal period are implemented in and outside of Indigenous communities. The effectiveness of these efforts should be evaluated.

1 CONTEXT

Public health organizations recommend against alcohol use during pregnancy, beginning at conception (Public Health Agency of Canada, 2021; MSSS, 2016). During pregnancy, alcohol use is the leading cause of birth defects. The effects of alcohol on children are variable and permanent. Alcohol use during pregnancy can also result in low birth weight or the premature death of the baby (Masella, 2021).

In addition, the social and health consequences of psychoactive substance use (PAS) in a parental context are extensive. Alcohol or drug dependency issues are associated with increased difficulties in parenting, erosion of support and sharing networks, and a loss of connection to one's culture (Chansonneuve, 2007; Lévesque et al., 2018).

Because of its impact on the health of families and future generations, PAS use during the perinatal period is a public health concern for the entire population. In Québec, according to the 2006–2007 Canadian Maternity Experiences Survey, approximately two out of ten women reported having consumed alcohol during their last pregnancy (Public Health Agency of Canada, 2009). Among women, PAS use is often linked to challenges associated with social determinants of health such as low social support, poverty, and poor living conditions (Rutman et al., 2020). In Québec, as elsewhere in Canada, significant social inequalities in health are observed among Indigenous people and are reflected, among other things, in high levels of PAS use, which sometimes occurs during the perinatal period.

Understanding the factors that influence perinatal PAS use is essential to targeting prevention and health and wellness promotion strategies for First Nations and Inuit people. The context of perinatality and the changes accompanying motherhood add to the different realities of Indigenous women, which will be presented in the next section.

1.1 Indigenous people in Québec: diverse realities

At the time of the 2016 Canadian census, nearly 106,000 Indigenous people resided in Québec, representing 1% of the provincial population[1] (Statistics Canada, 2016a). The 55 Indigenous communities are spread throughout most of Québec's regions, but are mostly located in areas far from major urban centres.

The Nunavik, Terres-Cries-de-la-Baie-James, and Côte-Nord health regions account for half of the Indigenous population of Québec. One quarter of Indigenous communities have a population of fewer than 500 people and more than half have fewer than 1,000.

[1] Administrative data from different surveys are used to show trends. Gaps in the quality and relevance of statistical data for the Indigenous population have been identified (Smylie & Firestone, 2015).

Each of the 11 nations present on the territory of Québec is unique and distinguished by its culture, language, geography, and legal and political status. The James Bay and Northern Quebec Agreement (Cree and Inuit nations) and the Northeastern Quebec Agreement (Naskapi nation) give these three nations a unique status. They live on treaty lands[2]. These additional characteristics accentuate the variations in socioeconomic and socio-health conditions between nations and with the non-Indigenous population.

Just over half of Indigenous people live outside of these communities (Lévesque et al., 2019). There is a strong Indigenous presence in many cities such as Montréal, Québec, Val-d'Or, and Sept-Îles. Indigenous people move to cities for various reasons: health care, education, work, and housing. The movement of Indigenous people to the city is often temporary: the duration of their stay in the city varies and many make frequent trips between their community and the city. Cultural and family reasons as well as difficulties experienced in an urban environment often explain a return to the community (Regroupement des centres d'amitié autochtones du Québec [RCAAQ], 2008). Indigenous people living outside their home communities generally do not have access to available services and programs, with the exception of federal programs.

Moreover, Indigenous population income and education levels are improving, but remain below those of the non-Indigenous population (Reading & Halseth, 2013). In Québec, one fifth of Indigenous people live in overcrowded housing (more than one person per room). In addition, one third of Indigenous dwellings are in need of major repairs (Statistics Canada, 2016a).

From a demographic perspective, half of the First Nations population is under the age of 33 and half of the Inuit population is under the age of 22 (Statistics Canada, 2016a). Indigenous communities are growing at almost twice the rate of the general population, with one reason for this population expansion being the growing number of women of childbearing age and the high fertility rate of Indigenous women (Statistics Canada, 2017). However, actual population growth may be more modest due to the methodology and definitions used during the censuses[3] (Guimond et al., 2009).

Indigenous families are larger; they have four to five times the number of children as families in Québec as a whole (Statistics Canada, 2016b). Regarding parental structures, just over one third of families are single-parent households (Statistics Canada, 2016b).

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2 The Cree, Naskapi, and Inuit peoples are responsible for local and regional institutions in their territory in the following areas: health, housing, education, justice, public safety, hunting, fishing, and trapping.

3 Legislative changes to registration and band membership (Bill C-31 in 1985 and Bill C-3 in 2011) have increased the number of registrants. There has also been an increase in the number of Indigenous people living in urban areas as some Indigenous people living in cities have acquired legal status under the Indian Act. It is not only because more of them are leaving the communities.

Indigenous women are more likely to experience pregnancy at a young age (Joncas & Roy, 2015). According to Indigenous and Northern Affairs Canada (2012), the birth rate for Indigenous adolescents is 100 per 1,000, which is five to seven times higher than for non-Indigenous adolescents.

A high proportion of Indigenous people experience violence in the form of discrimination, racism, domestic violence, homicide, or childhood abuse (Bergeron et al., 2018). Indigenous women are particularly affected by this violence (Burczycka, 2016; National Inquiry into Missing and Murdered Indigenous Women and Girls [MMIWG], 2019a). They are more likely to witness and experience childhood sexual abuse and to have parents with addiction issues (MMIWG, 2019a; Lévesque et al., 2018).

As such, Indigenous women face significant barriers to optimal health and well-being, including sexism, violence, poverty, single parenthood, and low rates of graduation and employment (Halseth, 2013).

1.2 Data on psychoactive substance use

According to the First Nations Regional Health Survey (RHS), which is based on a sample of all First Nations in Québec except the Cree, more than half of adolescents do not drink alcohol (FNQLHSSC, 2018a). However, one quarter of adolescents aged 12 to 17 and half of young adults aged 18 to 34 have binge drinking habits[4] (FNQLHSSC, 2018a). According to the RHS, young Indigenous adults are the age group that uses the most cannabis.

There is some evidence that PAS use sometimes occurs during the perinatal period. According to RHS data, nearly one in ten First Nations children under the age of five was born to a mother who drank alcohol during her pregnancy (FNQLHSSC, 2018b).

Among Inuit women in Nunavik, at the time of the 2017 *Qanuilirpitaa?* survey, approximately two out of ten women reported drinking alcohol occasionally during their last pregnancy. Furthermore, 54% of Inuit women are between 18 and 24 years of age at the time of their first pregnancy (Moisan et al., 2021). Finally, one quarter of Inuit aged 16 to 20 reported drinking excessively on a weekly basis, i.e., five or more drinks on one occasion (Bélanger et al., 2020).

There are no data from Québec on opioid use during the perinatal period among Indigenous women. In the United States, the prevalence of opioid use among rural First Nations (American Indian) adolescents in grade 12 is higher than the national prevalence (Stanley et al., 2021). Furthermore, data from Ontario show a significant increase in opioid-exposed pregnancies in recent years among First Nations women (Russell et al., 2016).

[4] According to the RHS, binge drinking is defined as having four or more drinks on one occasion for women (five or more drinks for men) or drinking on more than five occasions in a week.

1.3 Perinatal psychoactive substance use: a public health issue

Prenatal exposure to alcohol can cause intellectual and developmental disabilities and cognitive or behavioural problems. This multitude of conditions is grouped under the diagnostic term fetal alcohol spectrum disorder (FASD) (April et al., 2011). Several cognitive, socio-emotional, social, and behavioural difficulties are experienced by individuals with FASD and may be exacerbated during adolescence. Long-term consequences include mental health problems, mood and personality disorders, behavioural problems, delinquency, inappropriate sexual behaviours, and PAS use (April et al., 2011; Masella, 2021). The prevalence of FASD in Canada is estimated to be 4% (Canada FASD Research Network, 2018). There are no representative data from Québec for either the general population or the Indigenous population.

The precise effects of each substance on the unborn baby are impossible to determine, as exposure to different environmental factors also influences development. Prenatal cannabis use is associated with preterm deliveries, low birth weight babies, and emergency neonatal care admissions (Hayatbakhsh et al., 2012). Prenatal opioid exposure is associated with neonatal abstinence syndrome. This includes withdrawal symptoms that affect the central nervous system and the infant's gastrointestinal and respiratory systems (Finnegan, 2013).

In Nunavik, a qualitative study highlighted the educational difficulties experienced by children in connection with their family members' PAS use (Brunelle et al., 2009). Finally, this same study reminds us that excessive alcohol use, combined with crowded living conditions, increases the risk of interpersonal violence.

1.4 What about social inequalities in health?

The diverse realities of Indigenous women and their varied sociodemographic conditions demonstrate the importance of considering the different social determinants that influence PAS use during the perinatal period.

Social inequalities in health are unfair and systematic differences in health within and between social groups (World Health Organization Commission on Social Determinants of Health, 2016). They arise from an uneven distribution of social determinants of health that are shaped by a set of broader forces such as economics and social policy. Systematic differences in opportunities for fulfilment are associated with people's unequal positions in the socioeconomic hierarchy.

Beyond this, research has shown that the effects of risk factors are cumulative; negative health outcomes increase with the number of risk factors to which one is exposed (Siltanen & Doucet, 2008). The most disadvantaged people in a group also have the poorest health outcomes, across all segments of society. Findings from the 2012 Indigenous Peoples Survey support this view: as the number of social determinants of poor health status increases for a First Nations person aged 15 years and older living off reserve[5], his or her health status worsens (chronic health problems, self-rated general health, and self-rated mental health) (Rotenberg, 2016).

1.5 Objectives

To better understand the social determinants of perinatal PAS use among Indigenous women, a knowledge synthesis was conducted.

It had three specific objectives:

- Identify the social determinants of perinatal PAS use among Indigenous women.
- Analyze the relationships between different social determinants.
- Suggest relevant courses of action in accordance with the scientific findings raised.

[5] Statistics Canada uses "off reserve" for place of residence. *Reserve* is a census subdivision legally affiliated with a First Nation or Indian band.

2 METHODOLOGY

This publication follows the principles of a systematized narrative review, that is, it includes some elements of a systematic review without being one (Grant & Booth, 2009). The methodological steps are presented in this section.

First, the concepts under study that are not included in the glossary are defined. Next, the literature search method is outlined. The evaluation of the scientific quality of the selected publications using the Crowe Critical Appraisal Tool is explained. Next is the data extraction step from a predefined grid. Finally, for data analysis, the dualistic technique of inductive and deductive thematic analysis is developed. The deductive approach (Crabtree & Miller, 1999) is based on the theory of the Integrated Life Course and Social Determinants Model of Aboriginal Health (Reading & Wien, 2009). The inductive approach is based on additional themes that emerge from the data collected (Boyatzis, 1998).

2.1 Definitions of the concepts being studied

For this synthesis, psychoactive substance use (PAS) refers primarily to alcohol use, but also to cannabis and opioids. In the tables and when relevant, the substance(s) studied will be specified.

The perinatal period covers the period from the planning of the pregnancy or conception to the child's first birthday (MSSS, 2008). It therefore includes all trimesters of pregnancy as well as breastfeeding. The experience of motherhood is examined in its physical, psychological, and social dimensions. When possible and relevant, the period studied will also be specified.

2.2 Literature search

A literature review was conducted to gather a body of relevant literature on the social determinants of perinatal PAS use among Indigenous women. The literature search strategy, conducted in collaboration with an INSPQ librarian, was inspired by that of Shahram's (2016) systematic review, which aimed to identify and understand the social determinants of PAS use among Indigenous women of all ages.

The publications selected for this synthesis incorporate four concepts: social determinant(s), perinatal period, Indigenous women, and PAS use.

It can be challenging to define all of the terminologies used by authors when discussing social determinants of health and particularly those specific to Indigenous peoples (Bethune et al., 2019). The concept of determinant was not included in the literature search strategy in order to increase the number of results and avoid exclusion of relevant publications. Thus, the concepts of "Indigenous women," "perinatal period," and "PAS use" in various iterations and combinations guided the search in the MEDLINE, APA PsychInfo, Global Health, CINAHL, Psychology and Behavioral Sciences Collection, Public Affairs Index, and SocINDEX databases. Details of the search strategy are presented in Appendix 1.

The literature search produced a list of 580 publications. Using the inclusion and exclusion criteria in Table 2, an initial screening was performed based on titles and abstracts by two members of the team. Comparisons between the selections were made to verify the concordance, which was found to be very good. A second selection, carried out by the same team members, was made following the complete reading of the documents retained in the first selection. The literature search was conducted in March 2021. One publication, identified in May 2021 in the Indigenous Health Team's research monitoring, was added to the corpus. The final list includes 15 publications (14 scientific articles and one book chapter identified with EBSCO).

Table 1 Publication selection criteria

Criteria for inclusion	Criteria for exclusion
• Population: Indigenous women in the perinatal period • Objective: study the relationship between one or more social determinants and PAS use • Scientific literature: systematic reviews, knowledge syntheses, meta-analyses, primary studies • Grey literature: research reports, evaluation reports, theses • Similar to the context in Québec: other Canadian provinces and other countries with Indigenous peoples experiencing the effects of colonialism (New Zealand, Australia, the United States) • Period from 2000 to 2021, in English or French	• Results not reported separately for Indigenous women (included in larger group) • Risks associated with PAS use for women, their children, and their families • Evaluation of prevention or intervention strategies • Letters to the editor, comments, editorials

In order to identify a maximum of relevant publications for this synthesis, the bibliographies of the selected publications were searched using the snowball method. No new publications meeting the selection criteria were found.

A cursory overview of the grey literature was conducted in February 2020. Websites of recognized expert public health organizations and Québec, Canadian, and international Indigenous organizations were consulted. Searches using different keywords and Boolean operators were performed (Appendix 1). No publications meeting the selection criteria were identified.

2.3 Evaluation of methodological quality

The scientific quality of the publications was assessed using the Crowe Critical Appraisal Tool (CCAT). The CCAT was chosen because it allows for the evaluation of different types of research methodology. In addition, the CCAT has a high level of validity and reliability (Crowe et al., 2012).

The CCAT has eight categories: preliminaries, introduction, design, sampling, data collection, ethical matters, results, and discussion. Each category contains items to be marked as present, absent, or not applicable. Only items applicable to the research being evaluated are considered for the rating. Each category is rated on a scale of zero (no proof) to five (highest proof). The number of points awarded for each of the elements in the eight categories was determined by team consensus. The evaluation was also conducted by two team members (approximately 60% author and 40% collaborator). These steps were discussed to resolve any concerns.

2.4 Data extraction

An extraction grid was used to identify the characteristics of the selected publications: authors, year, and location of the study, methodology, study population, study period, consumption measures, and relevant findings. Data were extracted by two team members.

2.5 Data analysis

The method of data analysis for this synthesis is a dualistic technique of inductive and deductive thematic analysis. It incorporates the deductive approach with a codebook described by Crabtree and Miller (1999) and the inductive data-driven approach of Boyatzis (1998). This hybrid approach builds on a recognized conceptual framework in Indigenous health: the Integrated Life Course and Social Determinants Model of Aboriginal Health (Reading & Wien, 2009). It also reveals new themes, which are not covered by the chosen conceptual framework, directly from the data by means of inductive coding. Relevant findings from the selected publications were first classified according to the social determinants of the conceptual framework, presented below, referred to as deductive social determinants. Next, outcomes that did not fit into the categories of the conceptual framework were grouped into new themes called inductive social determinants.

2.5.1 Analytical framework: social determinants of Indigenous health

The National Collaborating Centre for Indigenous Health's Integrated Life Course and Social Determinants Model of Aboriginal Health includes the four dimensions of health (physical, emotional, mental, and spiritual) influenced by a multitude of social determinants (Reading & Wien, 2009). These social determinants of health are divided into three categories.

Proximal determinants are closely linked to daily life. They influence individuals' ability to meet their basic needs, they affect stressors, and they are the cause of health problems such as chronic diseases or depression. Proximal determinants include: health behaviours (e.g., physical activity), physical environments (e.g., housing conditions), education, employment and income, and food insecurity.

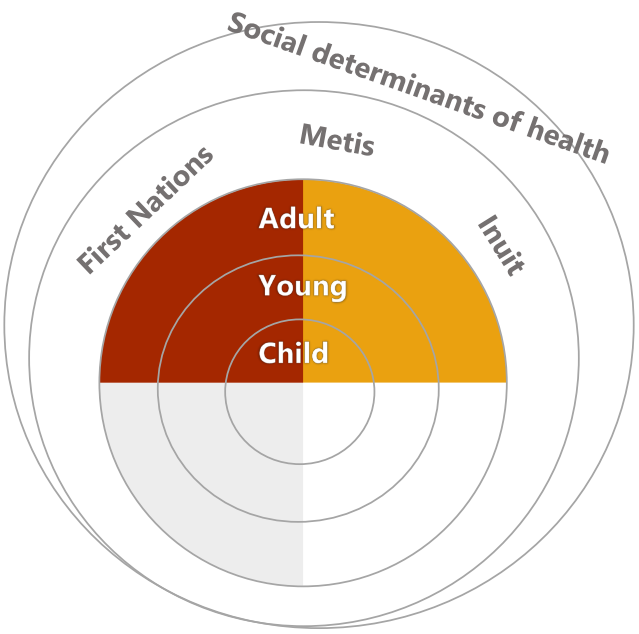
Intermediate determinants influence proximal determinants. For example, Reading and Wien (2009) explain that limited access to health care and services and negative interactions with health system providers make it more difficult to adopt healthy behaviours. Intermediate determinants include: community infrastructure, resources and capacities, health care systems, educational systems, cultural continuity, and environmental stewardship.

Although described as **distal**, other determinants affect the health and well-being of Indigenous people. These are the political, economic, and social contexts that construct intermediate and proximal determinants. Distal determinants include: colonialism, racism, and social exclusion as well as self-determination.

This model reminds us that the impacts of social determinants are present at different stages of life and that their effects are cumulative. First Nations, Inuit, and Métis are all represented in Figure 1 regardless of their place of residence. The three levels of social determinants exist as interlocking spheres.

The Integrated Life Course and Social Determinants Model of Aboriginal Health was chosen for three reasons. It is specific to the realities of Indigenous peoples in Canada and focuses on strengths, resilience, and protective factors. Furthermore, this framework was produced in collaboration with Indigenous organizations and uses visual representations and concepts that reflect Indigenous worldviews.

Figure 1 **Adaptation of the Integrated Life Course and Social Determinants Model of Aboriginal Health (Reading & Wien, 2009)**



Integrated Life Course and Social Determinants Model of Aboriginal Health

- Mental health
- Physical health
- Emotional health
- Spiritual health

Social determinants of health		
Proximal determinants	**Intermediate determinants**	**Distal determinants**
Health behaviours Employment and income Physical environments Education Food insecurity	Cultural continuity Environmental stewardship Community infrastructure, resources and capacities Health care systems Educational systems	Self-determination Colonialism Racism and social exclusion

2.6 Peer review

In keeping with the INSPQ's quality assurance mechanisms, this synthesis has been peer reviewed. The three reviewers' comments addressed the document's content, methodology, conclusions, completeness, and ethical issues. To ensure proper follow-up, the author has incorporated these comments into a table that includes a summary of how they were addressed in the final version. In addition, at each stage, the synthesis benefited from the input, review, and comments of the project team members. The author, project team members, and reviewers have completed their conflict-of-interest declarations. No situations of real, apparent, or potential conflict of interest have been identified.

3 RESULTS

3.1 Quality of the selected studies

The scores for assessing the methodological quality of the publications range from 66% to 90%, indicating an acceptable to good level of quality. Table 3 presents the selected publications, the type of methodology, and the outcome of the evaluation. The book chapter included in this review could not be evaluated with the CCAT, so the results of this research should be interpreted with caution. The scores, out of a total of 40 points, are shown as percentages. The tool's creators recommend publishing individual category scores and totals so that low scores in a category are not obscured; full results can be found in Appendix 3.

Table 2 Selected publications and quality assessment with the CCAT

Authors and date	Type of methodology	CCAT
Québec – Nunavik		
Fortin M. et al. (2016)	Quantitative — Prospective longitudinal study	88%
Fortin S. et al. (2012)	Quantitative — Prospective longitudinal study	88%
Muckle et al. (2011)	Quantitative — Prospective longitudinal study	85%
Canada		
Shahram et al. (2017a)	Qualitative — Semi-structured ethnographic interviews	80%
Shahram et al. (2017b)	Quantitative — Cross-sectional study	88%
Shahram et al. (2017c)	Qualitative — Life experience mapping and interviews	90%
Rutman et al. (2005)	Qualitative (book chapter) — Focus groups	n/a
The United States		
Barlow et al. (2010)	Quantitative — Cross-sectional study	75%
Bohn (2002)	Quantitative — Prospective longitudinal study	66%
Hebert and Sarche (2021)	Quantitative — Cross-sectional study	85%
Jorda et al. (2021)	Quantitative — Prospective longitudinal study	75%
Parker et al. (2010)	Quantitative — Cross-sectional study with control group	68%
Ye et al. (2020)	Quantitative — Prospective longitudinal study	78%
Australia		
Gibson et al. (2020)	Qualitative — Focus group and interviews	75%
Passey et al. (2014)	Quantitative — Cross-sectional study	83%

3.2 Description of selected publications and main results

A total of 15 publications were deemed relevant. Eleven of these publications present research based on quantitative methodologies, and four present research based on qualitative methodologies. For research using quantitative methodologies, five cross-sectional and six prospective longitudinal studies were included. No systematic literature reviews concerning the perinatal period were identified.

Three of the publications in the corpus present research that took place in Nunavik and four in the rest of Canada. Six American and two Australian publications were also selected.

The authors of seven publications focus on PAS use exclusively during pregnancy and not on use during the year after childbirth. In the corpus, alcohol is a PAS studied in all of the publications. The authors frequently group different types of drugs together for analysis. No data exclusive to opioid use during the perinatal period were found. A table describing the selected publications and relevant results is available in Appendix 2.

Table 4 summarizes the social determinants related to the relevant findings of the 15 selected publications. The deductive approach highlights that several social determinants from the Integrated Life Course and Social Determinants Model of Aboriginal Health are not reflected in the literature findings: food insecurity, environmental stewardship, educational systems, community infrastructure, resources and capacities, self-determination, and racism and social exclusion.

Using the inductive approach, three new categories of social determinants were developed out of the relevant findings. Two are found at the proximal level: interpersonal violence and mental health and well-being. The third category is at the intermediate level: social environment.

In the next section, relevant findings from the different categories of social determinants are presented. Social determinants can act in two ways: either as a risk factor or as a protective factor for perinatal PAS use among Indigenous women. To improve readability, for each category of determinant, the risk factor will be presented first and the protective factor second. A summary of protective factors closes out the results section.

Table 3 Social determinants related to relevant findings in the selected publications

	Québec – Nunavik			Canada				The United States						Australia		Total
	Fortin M. et al. (2016)	Fortin S. et al. (2012)	Muckle et al. (2011)	Shahram et al. (2017a)	Shah-ram et al. (2017b)	Shah-ram et al. (2017c)	Rutman et al. (2005)	Barlow et al. (2010)	Bohn (2002)	Hebert and Sarche (2021)	Jorda et al. (2021)	Parker et al. (2010)	Ye et al. (2020)	Gibson et al. (2020)	Passey et al. (2014)	
Proximal																
Employment and income		X	X		X	X		X		X	X		X			8
Education		X						X		X	X	X			X	6
Interpersonal violence		X	X	X	X	X		X	X	X				X		9
Physical environments					X			X		X			X			4
Mental health and well-being		X	X			X				X	X	X		X		7
Consumption habits	X		X				X			X					X	5
Food insecurity																0
Intermediate																
Social environment	X				X	X		X			X			X		6
Cultural continuity			X		X	X		X						X		5
Health care systems				X		X	X								X	4
Environmental stewardship																0
Educational systems																0
Community infrastructure, resources, and capacities																0
Distal																
Colonialism				X	X		X									3
Self-determination																0
Racism and social exclusion																0

Deductive social determinants
Inductive social determinants

3.3 Proximal determinates

All of the selected publications present relevant findings related to the proximal determinants of PAS use during the perinatal period. The proximal determinants identified were grouped into the following categories: 1) employment and income, 2) education level, 3) interpersonal violence, 4) physical environments, 5) mental health and well-being, and 6) consumption habits.

3.3.1 Employment and income: mixed results

For Indigenous women, the statistical relationship between employment and income variables and PAS use during the perinatal period differs from study to study and is sometimes contradictory. For some of these studies, the sample is composed of a large proportion of poor or unemployed women, so there is very little variation in socioeconomic conditions among participants. This limits the results' generalizability for all Indigenous women.

For a cohort of Inuit women in Nunavik, a profile of women more likely to use drugs and alcohol excessively in the year following birth emerged from the analyses carried out by Fortin S. et al. (2012): those **with fewer financial difficulties, but in an abusive relationship**. They represent almost a third of the sample. In analyses by Muckle et al. (2016), alcohol use and binge drinking, in general, were associated with **higher socioeconomic status among Inuit women in the sample**. In contrast, during the individual interviews, the Indigenous women Shahram (2017c) met expressed that their **low socioeconomic status** contributed to negative life experiences such as SPA use.

Jorda et al. (2021) identify protective factors for prenatal tobacco and alcohol use in a rural Native American community in the United States. **Employed women** are less likely to smoke and drink during pregnancy.

According to Hebert and Sarche's (2021) most recent publication, there was no statistically significant relationship between sociodemographic characteristics (marital status, poverty, education level) and alcohol use during pregnancy in a sample of Native American women from five American states. Analyses by Ye et al. (2020) show that the **socioeconomic status** of the sample of Native American women in North and South Dakota is relatively consistent and in the **lower category** (low income and government assistance). There was no statistically significant association between these variables and alcohol use during pregnancy. Barlow et al. (2010) report **little variability in the socioeconomic status** of their sample of First Nations girls, with no statistically significant relationship found between this determinant and PAS use.

3.3.2 Education: an influential factor

Four studies present converging results regarding the link between a low education level and the use of PAS (mainly alcohol) during the perinatal period, or, conversely, that a higher education level is a protective factor.

According to Fortin, S. et al. (2012), within one year of birth, **a lower level of education** is associated with heavy drinking among Inuit women in the sample. In the Parker et al. study (2010), mothers in the test group were **five times less likely to have a high school diploma** than mothers in the control group. The authors assume that the women recruited for the test group consumed alcohol during pregnancy. This use was neither measured nor confirmed.

In addition, according to Passey et al. (2014), for women in the sample with **10 to 11 years of education** the likelihood of using two or more substances (cannabis, alcohol, or tobacco) during pregnancy is lower than for women with less than 10 years of education. Finally, the analysis by Jorda et al. (2021) presents similar findings. For the Indigenous community in this study, education (more than 12 years of study) is a protective factor against smoking and drinking during pregnancy.

3.3.3 Interpersonal violence and adverse childhood experiences

More than half of the selected publications identified interpersonal violence as a risk factor for PAS use among Indigenous women in the perinatal period. Adverse childhood experiences and past or current interpersonal violence were the two items that emerged from the results.

For a sample of Native American adolescents in the United States, there is a statistically significant relationship between **parental history of alcohol problems, family history of suicide**, and drug use during pregnancy. In the life histories of the Indigenous women Shahram et al. (2017a) interviewed, family separations during childhood were traumatic experiences. All 23 participants had been in government care or **separated from their biological parents** at some point in their lives. While all women wanted to stop using during pregnancy, abstinence was difficult for some: PAS use is a coping mechanism for **past and present traumatic experiences as well as physical and sexual abuse** (Shahram et al., 2017a). **Traumatic events** (sexual and physical abuse, neglect as a child) also emerge from the thematic analysis of life experiences as influencing PAS use (Shahram et al. 2017c).

According to Fortin S. et al. (2012), within one year of birth, drug use is statistically related to **verbal or physical domestic violence** experienced by these women. For this same cohort, in general, Inuit women who binge drink were more likely than abstinent women to report that **their partners used verbal aggression more frequently** (Muckle et al. 2016). According to Hebert and Sarche (2021), in a sample of Native American women in the United States, **having experienced interpersonal violence** prior to pregnancy is associated with an increased

likelihood of drinking during pregnancy. Also, in Bohn's (2002) sample, there is a statistical link between physical and sexual abuse experienced by Indigenous women and PAS use prior to pregnancy. Finally, in the analysis by Gibson et al. (2020), it is reported that for some women abstinence is difficult because they are experiencing other problems such as **domestic violence**.

3.3.4 Physical environments: the effects of precariousness and relocation

Living in precarious and unstable housing conditions is linked to PAS use during pregnancy among Indigenous women (Barlow et al., 2010; Hebert & Sarche, 2021; Shahram et al. 2017b; Ye et al., 2020).

Native American adolescents in the United States who **lived in four or more homes** in the previous year were twice as likely to use PAS during pregnancy as those who lived in one home (Barlow et al., 2010). In the Ye et al. (2020) study, frequent relocation was the only significant risk factor for alcohol use and heavy drinking during pregnancy among Indigenous mothers. Just over a quarter of the sample moved at least once in the past year. **Experiencing homelessness** during pregnancy doubles the risk of alcohol use for that same period compared to women living in stable housing. The Pregnancy Risk Assessment Monitoring System (PRAMS) questionnaire uses the term "homeless," which the authors suggest is not appropriate for Indigenous women. They may experience housing instability and indicate that they are homeless (Hebert & Sarche, 2021). In addition, living in precarious housing is associated with high levels of drug use through smoke inhalation by participants in the Shahram et al. (2017b) study regardless of whether they are pregnant or not.

3.3.5 Mental health and well-being: a consideration

In light of the results of the selected publications, the relationship between well-being and mental health and PAS use during the perinatal period should be considered. Mental health and well-being affect a person's ability to change his or her consumption habits (Canadian Centre on Substance Use and Addiction, 2009). It appears that more depressed women use more, but the authors are unable to determine the direction of the relationship.

For a cohort of women in Nunavik, **psychological distress**, as measured by depressive symptoms after pregnancy, is associated with binge drinking during pregnancy (Muckle et al., 2011). In addition, **having suicidal thoughts** is associated with drug use within one year of childbirth (Fortin S. et al., 2012). Furthermore, in Hebert and Sarche's (2021) study, participants who reported having **symptoms of depression** prior to pregnancy were at greater risk for alcohol use during pregnancy. In the analysis by Gibson et al. (2020), it is reported that for some women abstinence could be difficult due to **mental health problems**. Finally, at the time of Parker et al.'s (2021) study, a greater proportion of women who were offered FASD screening for their child had a drinking problem and high levels of psychological distress compared to the

control group. For women in the test group, analyses indicate that severe psychological distress increases the odds of reporting a drinking problem by 2.5 times. When nuanced with the demographics of age and education, this result remains significant.

Desiring to achieve or have a satisfactory level of well-being is a protective factor for PAS use during the perinatal period. The women Shahram (2017c) met expressed that their **well-being and that of their family** significantly influenced whether or not they used PAS during their pregnancy. This relationship is also put forward in analyses by Jorda et al. (2021); **women who are not depressed** are less likely to smoke and drink during pregnancy.

3.3.6 Consumption habits before pregnancy

In the Integrated Life Course and Social Determinants Model of Aboriginal Health, the determinant named "health behaviours" groups together a variety of behaviours that influence health: physical activity, diet, and the use of PAS and tobacco. For the purposes of this synthesis, this determinant has been renamed "consumption habits." Indeed, four publications present data exclusively on PAS consumption habits and none on other health behaviours.

Among Inuit women in the sample studied by Muckle et al. (2016), **binge or heavy drinking** prior to pregnancy and **concurrent drug use** makes heavy drinking during pregnancy more likely. For this same cohort, **cannabis use** decreases the likelihood for women with heavy alcohol use to become abstinent in the year before conception (Fortin M. et al., 2016).

In the Passey et al. study (2014), over the course of pregnancy, the vast majority of women **who quit smoking cigarettes** also quit drinking alcohol. Also, **women who have never smoked** are very unlikely to use alcohol and cannabis during pregnancy.

For participants in the Hebert and Sarche (2021) study, there was no significant association between heavy drinking three months before pregnancy and drinking during pregnancy. The small number of studies and the non-convergence of results make it difficult to draw conclusions about an association.

3.4 Intermediate determinants

Ten of the selected publications reported links between intermediate determinants and PAS use during the perinatal period. Intermediate determinants were grouped into the following categories: 1) social environment, 2) cultural continuity, and 3) health care systems.

3.4.1 Social environment: the influence of family and friends

Family and significant others have an influence on Indigenous women's PAS use. Positive family relationships and strong social ties emerge as a protective factor.

According to Shahram et al. (2017b), **being single is associated with higher level (more than once per day) of drug use** through smoke inhalation by participants, whether pregnant or not. Also, in the analysis by Gibson et al. (2020), it is reported that some women in remote Aboriginal communities are likely to be aware of the harms of alcohol use during pregnancy. However, abstinence can be difficult because of their social environment, whether it is **their partner, family, or social network**.

According to Fortin M. et al.'s (2016) study, for Inuit women with pre-pregnancy heavy drinking, i.e., more than five standard drinks on one occasion, **being in a relationship is associated with** a greater likelihood of becoming abstinent in the year prior to conception. The analysis by Jorda et al. (2021) presents similar findings: social support is a protective factor. In the Tribal Nation studied, women **who live with someone** are less likely to smoke and drink during pregnancy.

In addition, in a study of First Nations adolescents, those **who said their parents or guardians had a good understanding of their interests** tended to have lower drug use (Barlow et al., 2010). Positive family relationships emerge as a protective factor among the participants encountered by Shahram et al. (2017c). Participants expressed that **social support and strong family ties** enabled them to stop or reduce their use of alcohol and drugs.

3.4.2 Cultural continuity: a protective effect

Among Inuit women in the Nunavik cohort, binge drinking is **associated with greater acculturation**, measured in living in less populated housing and by having greater proficiency in French and English (Muckle et al., 2016). In addition, living in metropolitan Vancouver, where social and cultural cohesion is more difficult, is linked to higher levels of drug use through smoke inhalation (Shahram et al., 2017b).

Conversely, three studies present cultural continuity as a protective factor against PAS use. The women in Shahram et al.'s (2017c) sample highlighted factors that helped them reduce or stop their substance use during pregnancy, including some **traditional values associated with motherhood**, a sacred time. The thinking is similar for Indigenous women in Australia. They reported that strong traditional Indigenous values were a protective factor against alcohol use during pregnancy (Gibson et al., 2020). Finally, in the study by Barlow et al. (2010), First Nations adolescents who agree with the importance of **strong traditional Indigenous values** are less likely to use drugs during pregnancy.

3.4.3 Health care systems: a mixed relationship

Three qualitative studies report the influence of health care and services on PAS use during the perinatal period. The **negative experiences** faced by women are highlighted. Furthermore, in analyses by Passey et al. (2014), while the majority of pregnant women are abstinent or use only one substance (alcohol, tobacco, or cannabis), those who report using multiple substances have a **reduced number of prenatal visits**.

Women mention the resilience and strength they had to show in order to reduce or stop their PAS use during pregnancy. According to them, these efforts were not recognized by all providers (Shahram et al., 2017a). Additionally, during interactions with health care and service network providers, feelings of shame and guilt surrounding PAS use during pregnancy emerge from mappings of Indigenous women's life experiences (Shahram et al., 2017c). Finally, during the focus groups, women mentioned that **they generally feel powerless** in their interactions with the health care system. The model of complete abstinence that predominates in the health care system makes them extremely vulnerable to failure. In their experience, even the tiniest deviation was reprimanded by practitioners and this rebuke was difficult for the women (Rutman et al., 2005).

3.5 Distal determinants

Three selected publications mention a distal determinant: colonialism.

3.5.1 The legacy of colonialism

Colonialism has undermined and continues to undermine cultural continuity, such as the prohibition of certain rituals or the requirement to send children to schools in a non-Indigenous educational system. It is associated with displacement, forced sedentism, and territorial dispossession, and limits community self-determination (Reading & Wien, 2009).

In statistical analyses by Shahram et al. (2017b), residential school attendance by the parents of the women in the sample is associated with higher level of drug use through smoke inhalation. While sharing their life experiences, the Indigenous women addressed many of the **intergenerational traumas** experienced in their families and communities. PAS use was therefore a coping strategy (Shahram et al., 2017a). For the women interviewed by Rutman et al. (2015), PAS use began on an occasional basis to **minimize psychological pain.** However, this turned into self-destructive behaviour and polyconsumption. According to these same women, many Indigenous people who attended residential schools also use drugs to minimize the pain that is passed on from one generation to the next.

3.6 Protective factors

Three protective factors for perinatal PAS use among Indigenous women emerged from the results and are summarized in Table 5. This table will be useful during the analysis to identify courses of action that act on the social determinants related to these factors.

Table 4 Protective factors for perinatal PAS use among Indigenous women

Protective factors	Social determinants	Publications
Educational success and employment opportunities	Employment and income Education level	Jorda et al., 2021 Parker et al., 2010 Passey et al., 2014
Favourable social environment: social support and strong family ties	Social environment	Barlow et al., 2010 Fortin M. et al., 2016 Gibson et al., 2020 Jorda et al., 2021 Shahram et al., 2017b, 2017c
Cultural continuity: connection to community, traditional values, and culture	Cultural continuity	Barlow et al., 2010 Gibson et al., 2020 Shahram et al., 2017b, 2017c

4 DISCUSSION

"Pregnancy and mothering experiences represented the most emotionally charged parts of women's life histories, often involving profound experiences of sadness, joy or a complex mix of several emotions.

Shahram et al., 2017a

4.1 Strengths of the selected publications

The publications covers a variety of determinants, which adds richness to the available data. The authors have accurately qualified their research findings. Most emphasize the need to consider the historical and political contexts in which Indigenous women live in order to improve understanding of perinatal PAS use.

The inclusion of quantitative and qualitative research generates a useful complementarity of data. The quantitative studies identified cover a variety of settings and examine relevant data obtained from large samples (a few hundred or even a few thousand women) and over extended periods (several months). Although they have the limitations described below, these studies credibly illustrate the links between certain social determinants and PAS use by Indigenous women during the perinatal period.

The qualitative research included uses innovative approaches and captures the experiences and perspectives of Indigenous women. Examining the life stories of Indigenous women highlights the complex relationships between various social determinants of health. In addition, it highlights the importance of considering intermediate determinants such as health care systems and Indigenous-specific determinants such as colonialism.

4.2 Relationship between determinants

With the inductive approach, elements that were not in the chosen framework have emerged and are supported by different studies. For the category of mental health and well-being, more depressed Indigenous women are more likely to use PAS during the perinatal period (Fortin S. et al., 2012; Gibson et al., 2020; Hebert & Sarche, 2021; Muckle et al., 2011; Parker et al., 2010). For the determinant named social environment, positive family relationships and strong social ties emerge as a protective factor (Barlow et al. 2010; Fortin M. et al. 2016; Gibson et al., 2020; Jorda et al. 2021; Shahram et al. 2017b, 2017c). Several authors highlight the effects of past and current interpersonal violence, as well as adverse childhood experiences, on Indigenous women's PAS use in general and during the perinatal period (Bohn, 2002; Fortin S. et al., 2012; Gibson et al., 2020; Hebert & Sarche, 2021; Muckle et al., 2016; Shahram et al., 2017a, 2017b, 2017c).

Several determinants presented in Reading and Wien's (2009) model are found in the selected publications: employment and income, education level, physical environments, health behaviours (consumption habits), cultural continuity, health care systems, and colonialism. The relationships between these determinants are discussed in the next section.

4.2.1 Proximal determinants are the most studied

In the selected publications, proximal determinants are the most studied. However, it is impossible to provide a complete picture of the factors influencing PAS use during the perinatal period using only these determinants. Also, they do not account for the multiple facets of the experience of motherhood and its particularities for each Indigenous nation.

Nevertheless, it appears that these proximal determinants have an influence on PAS use behaviours. The authors of the selected publications highlight the links between Indigenous women's living conditions and PAS use during the perinatal period. Also, regarding the physical environments, poor housing conditions are linked to PAS use during pregnancy among Indigenous women (Barlow et al., 2010; Hebert & Sarche, 2021; Shahram et al., 2017b; Ye et al., 2020). Other authors have reached the same conclusions (Dion, Kipling, & Stout, 2001).

While living conditions are also a social determinant of PAS use among non-Indigenous women (Shmulewitz & Hasin, 2019), Indigenous women are at greater risk than non-Indigenous women for experiencing poor living conditions. Various surveys have described alarming rates of poverty, unemployment, food insecurity, and poor housing conditions for Indigenous peoples (Office of the Auditor General of Canada, 2018; Shapiro et al., 2021). These living conditions also have consequences for the health and well-being of the mother and child and add to the consequences of PAS use.

According to some of the included studies, low education is associated with PAS use during the perinatal period among Indigenous women (Fortin, M. et al., 2012; Jorda et al., 2021, Parker et al. 2010; Passey et al., 2014). However, education level is also influenced by the educational system in place, an intermediate determinant not addressed in the selected publications. The latter takes little or no account of Indigenous notions of learning; the cultural experiences and values that are familiar to Indigenous youth do not always match what they are taught in school (RCAAQ, 2016). Educational success may be compromised.

In addition, different elements influence the education level. For example, many barriers to education, such as geographic distance from high schools and post-secondary institutions or difficulty meeting basic needs such as housing, must be overcome by Indigenous people (Lévesque & Polèse, 2015).

Finally, education level cannot be used in isolation as it does not reflect the level of skill and knowledge developed by individuals who learn from experts of their culture, language, and traditions (Battiste, 2013). Also, this measure does not reflect vocational training by individuals who, without having completed many years of education, have developed skills and expertise after working in different jobs (Battiste, 2013).

4.2.2 Distal determinants are absent from the majority of the selected publications

Only three of the selected publications highlight the intergenerational effects of colonialism on PAS use among Indigenous women during the perinatal period (Shahram et al., 2017a, 2017b; Rutman et al., 2005).

The effects of historical trauma on PAS use behaviours and addiction issues have been established by numerous authors (Bourassa et al., 2005; Truth and Reconciliation Commission of Canada [TRC], 2015; Royal Commission on Aboriginal Peoples of Canada, 1996; Tait & Davis-Jewish, 2003; Wilkes et al., 2017). The historical trauma experienced by Indigenous peoples, especially because of residential schools, forced relocations, the *Indian Act*, and other colonialist measures, is passed down between generations (Kaspar, 2014). They adversely affect the health and well-being of individuals, families, and communities.

Indeed, historical events and government policies have led to social, cultural, and identity upheavals. They have influenced the social determinants of Indigenous health in important ways and are still having an effect today (Bergeron et al., 2018). Research by the Aboriginal Healing Foundation has demonstrated the disastrous consequences of colonialism for Indigenous peoples in terms of violence and addictive behaviours (Chansonneuve, 2007).

Addressing intergenerational trauma is proposed as a way to deal with addiction among Indigenous women. For example, Walters and Simoni (2002) present a stress management model for Indigenous women with addictions. This model is based on empirical evidence showing that historical and contemporary discrimination against Indigenous women is a wound to the soul that influences outcomes in health and well-being.

4.2.3 Women who are victims of interpersonal violence and those who are depressed are more likely to use

Several authors highlight the effects of interpersonal violence on Indigenous women's PAS use in general and during the perinatal period (Bohn, 2002; Fortin S. et al., 2012; Gibson et al., 2020; Hebert & Sarche, 2021; Muckle et al., 2016; Shahram et al., 2017a, 2017b, 2017c). PAS use is thought to be a coping mechanism for women's negative childhood experiences and past and present physical and sexual abuse. This link between interpersonal violence and PAS use in the perinatal period is also present in the general population (Skagerström et al., 2011).

However, given the high prevalence of interpersonal violence in Indigenous populations, this risk factor is significant for Indigenous women. According to the 2015 First Nations Regional Health Survey, the majority of victims of domestic violence and sexual violence are women (FNQLHSSC, 2018b). According to the same source, almost 70% of Indigenous women victims of physical violence or threats reported being assaulted by a partner or ex-partner. They also experience

violence and sexual exploitation and are victims of femicide in significantly higher proportions than non-Indigenous women (MMIWG, 2019a, 2019b; Kuokkanen, 2015; Sweet, 2014). In addition, according to the 2006–2007 Canadian Maternity Experiences Survey, women who identify as Indigenous have an increased likelihood of experiencing interpersonal violence (verbal threats, sexual, or physical abuse) in the period surrounding pregnancy (Kingston et al., 2016).

At the same time, Indigenous people, particularly women, experience the effects of racism ingrained in institutions and structures. These experiences occur not only in their everyday lives, but also in health care and services (Inquiry Commission on Relations Between Indigenous Peoples and Certain Public Services in Québec [CERP], 2019; Goodman et al., 2017; McCallum & Perry, 2018). For example, in Canada, Indigenous women have experienced forced sterilizations and strong pressure to have abortions in health systems (FNQLHSSC, 2021; Stote, 2012; Stote, 2015).

In addition, the relationship between mental health and well-being and PAS use during the perinatal period must be considered. Among Indigenous women, symptoms of depression are related to PAS use during the perinatal period (Fortin S. et al., 2012; Gibson et al., 2020; Hebert & Sarche, 2021; Muckle et al., 2011; Parker et al., 2010). Similar findings emerge from a Canadian study; the most important risk factor for tobacco, cannabis, or alcohol use among women who attended an Ontario hospital was depression (Brown et al., 2019). Health care systems, an intermediate determinant, influence mental health and well-being (Reading & Wien, 2009). Receiving adequate support and treatment can be more difficult when interactions with the health care and health service system are negative (Shahram et al., 2017a, 2017c; Rutman et al., 2005).

4.2.4 Strengths to act on: the social environment and cultural continuity

The role played by First Nations and Inuit women is important. As mothers and primary caregivers, their influence extends to the next generation (Smylie, 2012). Indigenous women are a pillar of knowledge transmission connected to the territory (Basile, 2017). In addition, a growing number of Indigenous women are becoming involved in local and national governance (Hervé, 2013). They actively contribute to the development and well-being of their families and communities. As a result, two social determinants emerged as forces to act upon: social support and cultural continuity.

Positive family relationships and strong social ties emerge as a protective factor. A supportive social environment may contribute to the cessation or reduction of PAS use by Indigenous women in the perinatal period (Barlow et al., 2010; Fortin M. et al., 2016; Gibson et al., 2020; Jorda et al., 2021; Shahram et al., 2017b, 2017c). Furthermore, Indigenous women have emphasized that their loved ones' well-being is essential and that is why they have stopped using (Shahram et al., 2017c).

Also, connection to the community, traditional values, and culture may act as protective factors. Barlow et al. (2010), Gibson et al. (2020), and Shahram et al. (2017c) mention the importance of cultural continuity for reducing or stopping PAS use during pregnancy. Traditional cultures, cultural values, sacred knowledge, language, and cultural and spiritual practices are considered essential determinants of the health and well-being of Indigenous individuals, families, and communities (Castellano, 2006; RCAP, 1993; Inuit Tapiriit Kanatami, 2014).

4.3 Methodological considerations

The data presented in this report should be interpreted with caution. Some methodological shortcomings in the selected publications were identified. In addition, some elements have not been addressed in this knowledge synthesis.

4.3.1 Methodological limitations of the selected publications

Limitations in sampling methods were identified. The majority of publications analysed use convenience sampling. This non-probabilistic method involves recruiting easily available participants and may limit the robustness of the data.

In some cases, recruitment was carried out with women who were using perinatal clinic services. The women recruited therefore have access to and use perinatal services. Their possibly lower use of PAS, therefore, does not inhibit their use of health care and services and may predict better maternal and infant health than women who do not use these services (Schempf & Strobino, 2009).

In other cases, the women recruited were involved in a project on Indigenous people who were experiencing homelessness, using drugs, and in some cases practising survival sex[6]. These women represent a stratum of the population experiencing multiple challenges, and the proportion of women who use PAS may be higher in these samples than in the general Indigenous population. Their realities are also very different.

Conversely, as Hebert and Sarche (2021) point out, the proportion of Indigenous women who use PAS perinatally may be lower in some of the samples studied and may not represent all Indigenous women. First Nations women who consume alcohol during pregnancy would be less likely to participate in studies of PAS use than white women (Hebert & Sarche, 2021). Muckle et al. (2011) also hypothesize that women who consume alcohol in greater quantities would be more likely to decline to participate in this type of study.

[6] The practice of homeless or socially disadvantaged people engaging in prostitution to meet basic needs such as food, a place to sleep, or drugs (Shahram et al., 2016).

Furthermore, repeated use of the same sample decreases the ability to determine associations since, although they recur from article to article, they are based on the same data. In the corpus, three articles on Inuit women analyze data from the same sample and two American studies also used the same sample (the Safe Passage Study).

Access to and the legality of PAS vary from community to community, province to province, state to state, and country to country. The results of one study cannot accurately reflect the different realities experienced by all Indigenous women.

Furthermore, biases in data collection methods were identified. Social desirability, that is, the desire to look good, may have distorted some of the results. Some women may have been afraid to answer questions honestly about their consumption habits, a sensitive topic. Indeed, some women may have believed that their responses would lead to the removal of their baby by child protection services.

For some studies, health care providers were used to collect the data. For others, few details on data collection methods are available. As a result, it is difficult to judge the quality of the data obtained in these cases.

In addition, most of the studies reviewed gave little or no consideration to Indigenous notions of health and well-being, motherhood and childbearing, or personal responsibilities and freedoms. Examining them would refine our understanding of the factors that lead to use and, more importantly, which factors are protective.

The majority of the selected publications come from quantitative research. Limitations to the data presented in this knowledge synthesis must therefore be considered. On the one hand, quantitative studies generally aim to analyze the statistical relationships between one or more social determinants of health (in this case mainly socioeconomic status) and PAS use. The available data are therefore not particularly diversified and make it difficult to understand the complex and varied contexts of Indigenous women. On the other hand, while these studies aim to establish relationships between this use and social determinants of health, they do not explain how these relationships work.

As for qualitative research, it also has its limitations. In particular, it does not allow the weight of each of the social determinants to be quantified and their interaction to be analyzed.

4.3.2 Limitations of the knowledge synthesis

This knowledge synthesis was conducted to identify any relevant publications. The methodology was developed to ensure completeness, consistency, and validity. The synthesis identified relevant data on the social determinants of PAS use among Indigenous women in the perinatal period. Despite the precautions taken, it is possible that relevant documents have not been included.

The number of publications presented in this synthesis reflects the nature of the data available: knowledge on the subject is limited. The ability to draw clear conclusions about the determinants is limited as the analysis is exclusively descriptive.

Also, a limitation to the choice of conceptual framework emerged at the time of writing. Reading and Wien (2009) do not expose the breakdown of determinant levels in their figure. The interactions between the three levels of determinants are abstract, which makes analyzing them more difficult.

Another aspect not addressed in this synthesis is the effect of primiparity on use and on the maintenance of this behaviour during subsequent pregnancies and breastfeeding.

Additionally, the keywords used were not intended to identify publications addressing prescription drug misuse. No studies were excluded on the basis of including prescription drugs in the list of PAS studied. Furthermore, the selected publications do not present any results related to this issue.

Overall, the exclusive consideration of the perinatal period is another limitation of this synthesis. Examination of Indigenous women's use of PAS not only during this short period of time but also throughout their lives is necessary. This knowledge synthesis focuses on a specific period of time, but we should remember that this is part of a much broader life trajectory.

4.4 Courses of action

Three courses of action emerge from the findings and analysis of the selected publications. Several findings are consistent with the results of major surveys and calls for action by the TRC, CERP, and MMIWG. Subsequent proposals may serve as a starting point for future research or prevention activities.

4.4.1 Improve the living conditions of Indigenous peoples, particularly Indigenous women

Reducing or stopping PAS use by Indigenous women involves improving their living conditions: employment, education, and housing. While living conditions are also a social determinant of PAS use among non-Indigenous women (Shmulewitz & Hasin, 2019), Indigenous women are at greater risk than non-Indigenous women for experiencing poor living conditions (Office of the Auditor General of Canada, 2018). Indigenous women are also at greater risk of experiencing interpersonal violence; victims of interpersonal violence are more likely to use PAS during the perinatal period.

For Indigenous women, systemic changes are needed to reduce inequalities (TRC, 2015). These changes must be the result of collaboration with Indigenous women and their communities to ensure they are relevant and effective: policy changes, program implementation, choice of approaches, adaptation of health care and services, etc. Indeed, interventions to improve living conditions must reflect the diversity of Indigenous women's realities and be adapted to their needs. Strategies that target living conditions have the potential to reduce health problems experienced by women and Indigenous populations in Canada (Reading & Halseth, 2013).

4.4.2 Consider all the social determinants of psychoactive substance use with a focus on cultural safety and self-determination

Addressing the full range of social determinants of health refocuses conversations about PAS use around well-being and eliminates stigma and individual blame (Wolfson et al., 2019). Although few studies in this synthesis address this aspect, intergenerational trauma, colonialism, discrimination, racism, and disruption of traditions impact the health, well-being, and PAS use behaviours of Indigenous women in the perinatal period (Lévesque et al. 2018; Shahram et al., 2016; Tait & Davis-Jewish, 2003. In addition, the relationship between mental health and well-being and PAS use during the perinatal period must be considered. Relevant and accessible health care and services for Indigenous women must be promoted in close collaboration with Indigenous authorities.

In this sense, health care and services must be adapted to the realities of these women, their experiences, and their culture. Approaches developed for non-Indigenous people are not always appropriate, safe, or effective for Indigenous people (Adelson, 2000; Castellano, 2006). The cultural safety approach includes adapting health care and services to patients' needs and culture (Blanchet Garneau & Pépin, 2012; Ramsden, 2002). Cultural safety increases patients' sense of security and is relevant to mental health as it provides appropriate and effective treatments for depression, anxiety, and stress (Van Wagner, 2007). The adoption of this approach also responds to calls for action by the TRC, CERP, and MMIWG.

Furthermore, self-determination is an essential facet of cultural safety to ensure the relevance and effectiveness of care and services for Indigenous people (TRC, 2015; Ramsden, 2002). It is also an important social determinant of health in Indigenous populations (Auger et al., 2016; Davy et al., 2016; Horrill et al., 2018). Self-determination can reduce the effects of colonization by enhancing feelings of pride in being Indigenous and controlling one's own destiny (Lawson-Te Aho & Liu, 2010). Measures to support the cessation or reduction of perinatal PAS use developed and implemented with Indigenous communities and women are more responsive to needs (Davy et al., 2016; MMIWG, 2017). Creating conditions that give Indigenous peoples influence in decision-making processes is integral to self-determination (Stearne et al., 2021).

4.4.3 Increase scientific knowledge and evaluate the effectiveness of prevention efforts

The methodological gaps identified in the selected publications highlight the need for additional research. Indigenous notions of health and well-being, motherhood and childbearing, or personal responsibilities and freedoms are given little or no attention. Examining them would sharpen our understanding of the mechanisms of protective factors.

Additional research on intermediate and distal social determinants could provide concrete targets for interventions to support Indigenous women. For example, none of the selected publications looked at community resources or educational systems. In the selected publications, some authors point to the need for further research to understand the interactions between social determinants and to better identify their particularities for Indigenous women. Research that prioritizes women's voices will provide new knowledge about culturally relevant ways to meet their needs.

Finally, activities to prevent PAS use in the perinatal period are implemented in Indigenous communities and outside the communities. These efforts will need to be evaluated to better understand their effects on the various determinants of use.

5 CONCLUSION

This knowledge synthesis shows that during the perinatal period, but also at other times in their lives, many factors determine the use of PAS among Indigenous women.

One way to reduce or stop PAS use by Indigenous women is to improve their living conditions (employment, education, and housing). The selected publications indicate that women lack the resources to cope with a multitude of social problems. Furthermore, depressed women are more likely to use PAS during the perinatal period.

Results also showed that victims of interpersonal violence were more likely to use PAS than those who had not been victims. PAS use is thought to be a coping mechanism for women's past and current physical and sexual abuse and negative childhood experiences.

In recent years, several authors have concluded that the historical trauma experienced by Indigenous peoples has had adverse effects on the health and well-being of Indigenous women and communities that are still being felt today. This is a reminder of the importance of considering the distal determinants of Indigenous health (political, economic, and social contexts) when analyzing health behaviours. These distal determinants are little studied in the selected publications, in part because of the challenges associated with their measurement. Sociodemographic characteristics (proximal determinants) are the most frequently measured variables.

Factors that contribute to the reduction or cessation of PAS use during the perinatal period include strong family ties, social support, connection to community, traditional values, and culture. Sacred knowledge, language, cultural, and spiritual practices are essential to the health and well-being of Indigenous individuals, families, and communities.

Approaches developed for non-Indigenous women are not always appropriate, safe, or effective for Indigenous women. In addition, the self-determination of Indigenous peoples is essential to ensure the relevance and effectiveness of care and services for them.

Finally, the prevention of PAS use in the perinatal period requires a set of measures to improve the living conditions of Indigenous peoples, build supportive social environments, and ensure cultural continuity, all in close collaboration with Indigenous institutions. The effectiveness of these efforts will need to be evaluated.

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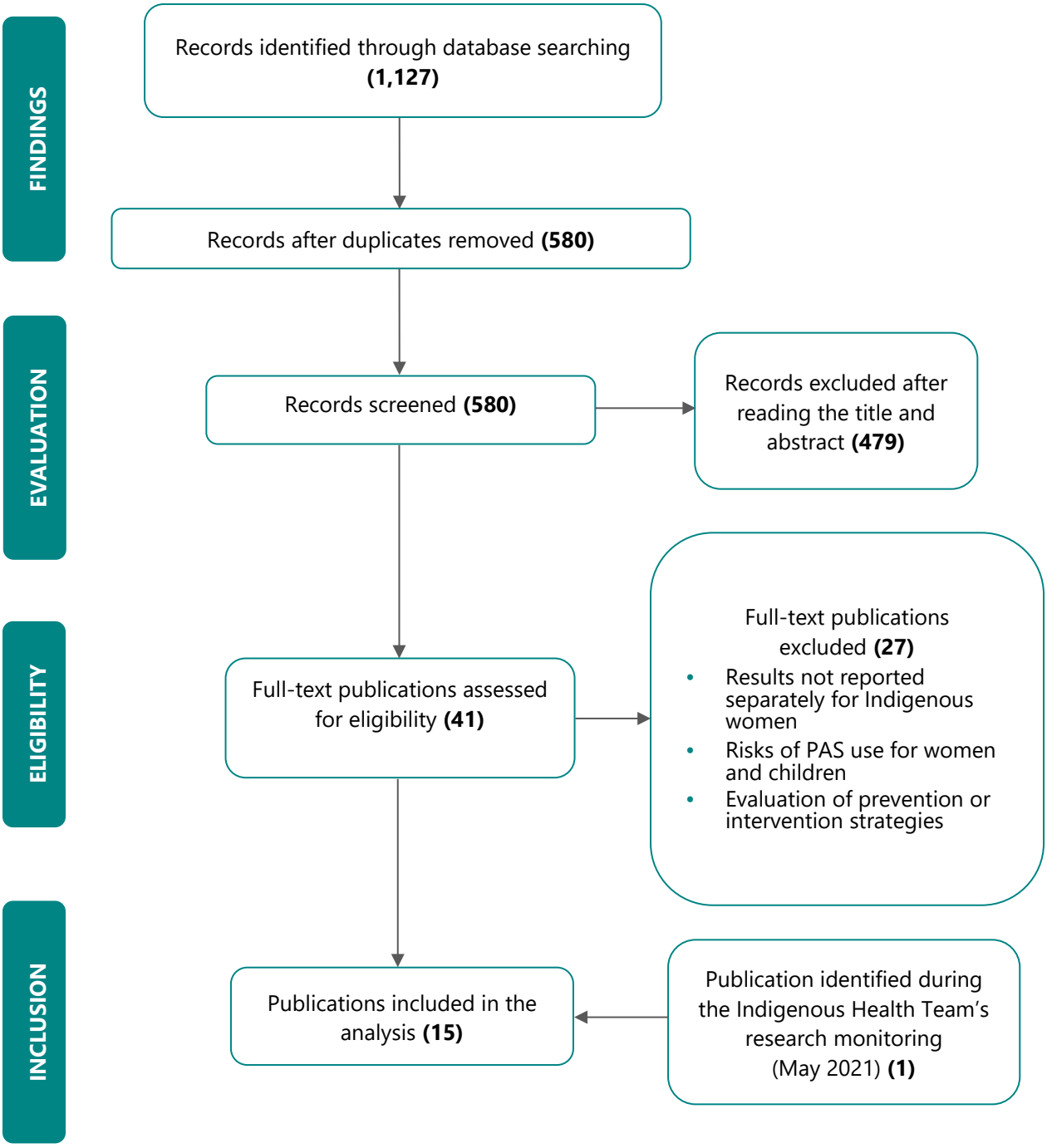
APPENDIX 1 DETAILED METHODOLOGY

Literature search flowchart



Adapted from the PRISMA 2009 Flow Diagram

Literature search strategy: scientific literature

Search strategy for *Ovid MEDLINE(R)*, accessed on 2021-03-04

#	Query	Results
1	Indigenous Peoples/ or exp american native continental ancestry group/ or oceanic ancestry group/ or (Aborigin* or Aleut* or Amerind* or autocht* or Eskimo* or (American adj Indian*) or indigenous or In?uit* or Inuk or Inuktitut* or Inupiat* or "First Nation$1" or "First Peoples" or Kalaallit* or Metis or Native or Natives or tribe or tribes or tribal or Koori or Dene or Algonqui* or Iroquoi* or Maori or "Kanata Maoli" or Micmac or Mi'kmaq or Wendat* or Huron* or Mohawk* or "AI/AN" or Navajo or Apache or Cree).ti,ab,kf.	336,324
2	Breast Feeding/ or exp Pregnancy/ or Pregnant Women/ or exp Maternal Health Services/ or Reproductive Health/ or Maternal Welfare/ or perinatal care/ or postnatal care/ or Preconception Care/ or Prenatal Care/ or (pregnan* or gestation* or childbear* or "child bear*" or breastfeed* or "breast feed*" or antenatal* or antepartum* or prenatal* or perinatal* or postnatal* or postpartum* or "mother to be" or parturient* or gravid*).ti,ab,kf.	1,270,164
3	substance-related disorders/ or alcohol-related disorders/ or marijuana abuse/ or neonatal abstinence syndrome/ or exp opioid-related disorders/ or substance abuse, intravenous/ or exp substance withdrawal syndrome/ or Drug Dependency/ or Drug Addiction/ or Drug abuse/ or alcoholism/ or Drug dependency/ or Polydrug Abuse/ or Drug abuse prevention/ or exp alcohol drinking/ or exp Alcohol-Related Disorders/ or exp Alcoholic Beverages/ or Opioid-Related Disorders/ or Opiate Overdose/ or exp Analgesics, Opioid/ or Cannabis/ or exp "Marijuana Use"/ or Marijuana Abuse/	416,498
4	(alcohol* or "binge drink*" or ((drink* or liquor* or beer or beers or wine or wines or spirit or spirits or substance*) adj5 (abuse* or dependence or dependency or disorder* or misuse* or use* or using or problem* or addict*))). ti,ab,kf.	426,426
5	(buprenorphine or codeine or fentanyl or hydromorphone or methadone or morphine or opioid* or oxycodone or tramadol).ti,ab,kf.	158,978
6	(cannabi* or dronabinol or tetrahydrocannabi* or hash or Hashish* or hasheesh* or haschisch* or hachisch* or haschich* or hashisch* or marijuana* or marihuana* or maribuana* or tetrahydro cannabi* or THC).ti,ab,kf.	53,174
7	or/3–6	756,259
8	and/1–2,7	596
9	8 not (Comment or editorial or interview or letter or news).pt.	589
10	9 and (english or french).lg.	579
11	..l/ 10 yr=2000–3000	451

Research strategy for *APA PsycInfo*, accessed on 2021-03-04

#	Query	Results
1	exp indigenous populations/	14,036
2	(Aborigin* or Aleut* or Amerind* or autocht* or Eskimo* or "American Indian*" or indigenous or In?uit* or Inuk or Inuktitut* or Inupiat* or "First Nation$1" or "First Peoples" or Kalaallit* or Metis or Native or Natives or tribe or tribes or tribal or Koori or Dene or Algonqui* or Iroquoi* or Maori or "Kanata Maoli" or Micmac or Mi'kmaq or Wendat* or Huron* or Mohawk* or "AI/AN" or Navajo or Apache or Cree). ti, ab, id.	70,783
3	or/1–2	72,286
4	Breast Feeding/ or exp Pregnancy/ or expectant mothers/ or exp obstetrics/ or Reproductive Health/ or perinatal period/ or postnatal period/ or prenatal care/	56,830
5	(pregnan* or gestation* or childbear* or "child bear*" or breastfeed* or "breast feed*" or antenatal* or antepartum* or prenatal* or perinatal* or postnatal* or postpartum* or "mother to be" or parturient* or gravid*). ti, ab, id.	96,574
6	or/4–5	110,329
7	exp "substance use disorder"/ or exp alcohol abuse/ or marijuana usage/ or « cannabis use disorder »/or exp drug withdrawal/ or « opioid use disorder »/or drug dependency/ or drug addiction/ or « substance use prevention »/or exp alcohol drinking patterns/ or alcohol drinking attitudes/ or exp alcoholic beverages/ or drug overdoses/ or exp cannabis/	161,021
8	(alcohol* or "binge drink*" or ((drink* or liquor* or beer or beers or wine or wines or spirit or spirits or substance*) adj5 (abuse* or dependence or dependency or disorder* or misuse* or use* or using or problem* or addict*))). ti, ab, id.	19,658
9	(buprenorphine or codeine or fentanyl or hydromorphone or methadone or morphine or opioid* or oxycodone or tramadol). ti, ab, id.	37,640
10	(cannabi* or dronabinol or tetrahydrocannabi* or hash or Hashish* or hasheesh* or haschisch* or hachisch* or haschich* or hashisch* or marijuana* or marihuana* or maribuana* or tetrahydro cannabi* or THC). ti, ab, id.	26,459
11	or/7–10	267,873
12	and/3,6,11	243
13	12 and (french or english).lg.	237
14	..l/ 13 yr=2000–3000	205

Research strategy for *Global Health*, accessed on 2021-03-04

#	Query	Results
1	(Aborigin* or Aleut* or Amerind* or autocht* or Eskimo* or "American Indian*" or indigenous or In?uit* or Inuk or Inuktitut* or Inupiat* or "First Nation$1" or "First Peoples" or Kalaallit* or Metis or Native or Natives or tribe or tribes or tribal or Koori or Dene or Algonqui* or Iroquoi* or Maori or "Kanata Maoli" or Micmac or Mi'kmaq or Wendat* or Huron* or Mohawk* or "AI/AN" or Navajo or Apache or Cree). ti, ab.	67,700
2	(pregnan* or gestation* or childbear* or "child bear*" or breastfeed* or "breast feed*" or antenatal* or antepartum* or prenatal* or perinatal* or postnatal* or postpartum* or "mother to be" or parturient* or gravid*).ti,ab.	164,660
3	(alcohol* or "binge drink*" or ((drink* or liquor* or beer or beers or wine or wines or spirit or spirits or substance*) adj3 (abuse* or dependence or dependency or disorder* or misuse* or use* or using or problem* or addict*))).ti,ab.	103,984
4	(buprenorphine or codeine or fentanyl or hydromorphone or methadone or morphine or opioid* or oxycodone or tramadol).ti,ab.	10,082
5	(cannabi* or dronabinol or tetrahydrocannabi* or hash or Hashish* or hasheesh* or haschisch* or hachisch* or haschich* or hashisch* or marijuana* or marihuana* or maribuana* or tetrahydro cannabi* or THC). ti, ab.	9,607
6	or/3–5	117,563
7	and/1–2,6	180
8	(french or english). lg.	3,150,022
9	and/7–8	174
10	..l/ 9 yr=2000–3000	154
11	or/7–10	267,873
12	and/3,6,11	243
13	12 and (french or english).lg.	237
14	.. l/13 yr=2000–3000	205

Research strategy for *EBSCO*, accessed on 2021-03-04
Comprehensive search of CINAHL, Psychology and Behavioral Sciences Collection, Public Affairs Index, SocINDEX with Full Text

#	Query	Results
S1	TI (Aborigin* or Aleut* or Amerind* or autocht* or Eskimo* or "American Indian*" or indigenous or In?uit* or Inuk or Inuktitut* or Inupiat* or "First Nations" or "First Peoples" or Kalaallit* or Métis or Native or Natives or tribe or tribes or tribal or Koori or Dene or Algonqui* or Iroquoi* or Maori or "Kanata Maoli" or Micmac or Mi'kmaq or Wendat* or Huron* or Mohawk* or "AI/AN" or Navajo or Apache or Cree) OR AB (Aborigin* or Aleut* or Amerind* or autocht* or Eskimo* or "American Indian*" or indigenous or In?uit* or Inuk or Inuktitut* or Inupiat* or "First Nations" or "First Peoples" or Kalaallit* or Metis or Native or Natives or tribe or tribes or tribal or Koori or Dene or Algonqui* or Iroquoi* or Maori or "Kanata Maoli" or Micmac or Mi'kmaq or Wendat* or Huron* or Mohawk* or "AI/AN" or Navajo or Apache or Cree)	127,759
S2	TI (pregnan* or gestation* or childbear* or "child bear*" or breastfeed* or "breast feed*" or antenatal* or antepartum* or prenatal* or perinatal* or postnatal* or postpartum* or "mother to be" or parturient* or gravid*) OR AB (pregnan* or gestation* or childbear* or "child bear*" or breastfeed* or "breast feed*" or antenatal* or antepartum* or prenatal* or perinatal* or postnatal* or postpartum* or "mother to be" or parturient* or gravid*)	336,102
S3	TI (alcohol* or "binge drink*" or ((drink* or liquor* or beer or beers or wine or wines or spirit or spirits or substance*) N2 (abuse* or dependence or dependency or disorder* or misuse* or use* or using or problem* or addict*))) OR AB (alcohol* or "binge drink*" or ((drink* or liquor* or beer or beers or wine or wines or spirit or spirits or substance*) N2 (abuse* or dependence or dependency or disorder* or misuse* or use* or using or problem* or addict*)))	242,604
S4	TI (buprenorphine or codeine or fentanyl or hydromorphone or methadone or morphine or opioid* or oxycodone or tramadol) OR AB (buprenorphine or codeine or fentanyl or hydromorphone or methadone or morphine or opioid* or oxycodone or tramadol	63,936
S5	TI (cannabi* or dronabinol or tetrahydrocannabi* or hash or Hashish* or hasheesh* or haschisch* or hachisch* or haschich* or hashisch* or marijuana* or marihuana* or maribuana* or (tetrahydro cannabi*) or THC) OR AB (cannabi* or dronabinol or tetrahydrocannabi* or hash or Hashish* or hasheesh* or haschisch* or hachisch* or haschich* or hashisch* or marijuana* or marihuana* or maribuana* or (tetrahydro cannabi*) or THC)	35,725
S6	S3 OR S4 OR S5	318,241
S7	S1 AND S2 AND S6	412
S8	LA [english OR french]	12,374,287
S9	2000–3000 DT	9,994,705
S7	S7 AND S8 AND S9	372

Literature search strategy: grey literature

Generalist organizations

- Canadian Public Health Association
- American Public Health Association
- Public Health Agency of Canada
- National Collaborating Centre for Determinants of Health
- Canadian Centre on Substance Use and Addiction
- Institut national d'excellence en santé et en services sociaux
- McMaster Health Forum
- Ministère de la Santé et des Services sociaux
- NCD Alliance
- National Institute of Heath
- NSW Government
- Ministry of Health – New Zealand
- Ontario Public Health Association
- Réseau de recherche en santé des populations du Québec
- World Health Organization

Indigenous health organizations

- First Nations Information Governance Centre
- National Collaborating Centre for Indigenous Health
- Centre interuniversitaire d'études et de recherches autochtones
- First Nations of Quebec and Labrador Health and Social Services Commission
- Nunavik Regional Board of Health and Social Services
- Inuit Tapiriit Kanatami
- Government of Nunavut
- Regroupement des Centres d'amitié autochtones du Québec
- Pauktuutit Inuit women of Canada
- Projets autochtones du Québec
- Secrétariat aux affaires autochtones
- Thunderbird Partnership Foundation

Google research strategy

site: (indigenous OR inuit OR first nation)|(perinatal OR pregnant)|(psychoactive OR alcohol OR cannabis)
site: (autochtones OR inuit OR première nation)|(périnatal OR grossesse OR enceinte)|(psychoactive OR alcool OR cannabis)

APPENDIX 2 SYNTHESIS OF SELECTED PUBLICATIONS

Québec – Nunavik						
Authors and date	**Type of methodology**	**Population** **Recruitment** **Study period**	**Number of participants** **Age**	**Psychoactive substances** **Consumption measures**	**Social determinants**	**Relevant findings**
Fortin M. et al. (2016)	Quantitative Prospective longitudinal study Questionnaires at the first prenatal visit and at 1 year postpartum	Inuit women from three Nunavik communities (Puvirnituq, Inukjuak, and Kuujjuarapik) During the first prenatal visit between November 1995 and November 2000 (Environmental Contaminants and Child Development Study) 1 year before conception to one year postpartum	248 women 80% of the sample between 18 and 33 years old Teenagers and adults	Alcohol use and binge drinking (> 5 standard drinks on one occasion) Use of cannabis and other drugs (yes or no)	Employment and income Consumption habits	For women who drink excessively before pregnancy: • being in a relationship increases the likelihood of becoming abstinent in the year before conception; • cannabis use decreases the likelihood of becoming abstinent in the year prior to conception.
Fortin S. et al. (2012)	Quantitative Prospective longitudinal study Questionnaires at the first prenatal visit and at 1 year postpartum	Inuit women from three Nunavik communities (Puvirnituq, Inukjuak, and Kuujjuarapik) During the first prenatal visit between November 1995 and November 2000(Environmental Contaminants and Child Development Study) The year following birth	176 women Average age: 27 years Teenagers and adults	Alcohol use and binge drinking (> 5 standard drinks on one occasion) Use of cannabis and other drugs (yes or no)	Employment and income Education Mental health and well-being Interpersonal violence	The year following birth • Being a victim of verbal or physical domestic violence and having suicidal thoughts are associated with drug use; • lower education level is associated with suicidal thoughts and heavy drinking. 69.2% of women experienced distress in the year following birth. Two types of distress have emerged: • single women experiencing socioeconomic stress (40.1%); • women who are not experiencing socioeconomic stress but are in an abusive relationship and are more likely to abuse drugs or alcohol (29.1%).

Québec – Nunavik (continued)						
Authors and date	**Type of methodology**	**Population** **Recruitment** **Study period**	**Number of participants** **Age**	**Psychoactive substances** **Consumption measures**	**Social determinants**	**Relevant findings**
Muckle et al. (2011)	Quantitative Prospective longitudinal study Questionnaires at the first prenatal visit and at 1 year postpartum	Inuit women from three Nunavik communities (Puvirnituq, Inukjuak, and Kuujjuarapik) During the first prenatal visit between November 1995 and November 2000 (Environmental Contaminants and Child Development Study) 1 year before conception to 1 year postpartum	248 women Average age: 24.9 years Teenagers and adults	Alcohol use and binge drinking (> 5 standard drinks on one occasion) Use of cannabis and other drugs (yes or no)	Employment and income Cultural continuity Interpersonal violence Consumption habits Mental health and well-being	In general, binge or heavy drinking is associated with: • higher socioeconomic status according to the Hollingshead Index; • greater acculturation. Participants who drank heavily reported that their partners engaged in verbal aggression more frequently than did abstinent women. Participants who use alcohol occasionally or excessively prior to pregnancy and who also use drugs are at greater risk for excessive alcohol use during pregnancy. Psychological distress, as measured by symptoms of depression after pregnancy, is associated with occasional or heavy drinking during pregnancy.
Shahram et al. (2017a)	Qualitative Semi-structured ethnographic interviews	Indigenous women living in British Columbia During a study on vulnerability to hepatitis B and HIV among young Indigenous women and men (The Cedar Project) Women who experienced at least one pregnancy before age 30, 3 were pregnant at the time of the study	23 women Average age: 30 years Teenagers and adults (15 to 30 years old)	Self-reported alcohol and drug use problem	Interpersonal violence Colonialism Health systems	According to the young mothers, the use of PAS is a coping mechanism for multiple traumatic experiences. The sexual and physical abuses experienced as children by the women is linked to the addiction of certain members of their entourage. These substance use problems, according to them, stem from colonial practices on Indigenous families. Throughout women's life stories, family separations during childhood emerged as traumatic experiences. All of the participants had been in government care or separated from their biological parents at some point in their lives. Women mention their resilience and strength to reduce or stop their PAS use during pregnancy. These efforts were not recognized by some providers in the health care and services system.

Canada (continued)						
Authors and date	**Type of methodology**	**Population Recruitment Study period**	**Number of participants Age**	**Psychoactive substances Consumption measures**	**Social determinants**	**Relevant findings**
Shahram et al. (2017b)	Quantitative Cross-sectional study Questionnaire	Indigenous women living in British Columbia (Victoria, Prince George, and the BC Interior) During a study on vulnerability to hepatitis B and HIV among young Indigenous women and men (The Cedar Project) Women who have had at least one pregnancy before the age of 30, consumption in general	291 women Average age: 24 years Teenagers and adults (15 to 30 years old)	High drug use (> 1 time per day) Low drug use (≤ 1 time per day) Heavy drinking (≥ 6 standard drinks on one occasion > 1 time per month) Low alcohol consumption (≥6 standard drinks on one occasion ≤ 1 per month)	Physical environments Interpersonal violence Cultural continuity Social environment Colonialism Employment and income	Among participants who had experienced sexual violence, reporting the abuser was associated with lower alcohol consumption. The following factors are associated with high level use of smoked drug by participants: • having parents who attended residential schools; • living in the Vancouver urban area; • being single; • living in a precarious housing situation; • having experienced a large number of pregnancies; • having experienced a pregnancy at a young age; • having participated in survival sex within the last six months.

Canada (continued)						
Authors and date	**Type of methodology**	**Population Recruitment Study period**	**Number of participants Age**	**Psychoactive substances Consumption measures**	**Social determinants**	**Relevant findings**
Shahram et al. (2017c)	Qualitative Mapping of life experiences (CIRCLES – Charting Intersectional Relationships in the Context of Life Experiences with Substances) and interviews	Indigenous women living in British Columbia During a study on vulnerability to hepatitis B and HIV among young Indigenous women and men (The Cedar Project) Women who have had at least one pregnancy before the age of 30, discussion about the pregnancy	17 women Teenagers and adults from 15 to 30 years old	Personal experiences with alcohol and drug use	Employment and income Social environment Interpersonal violence Health systems Cultural continuity Mental health and well-being	Participants mapped factors influencing their PAS use during pregnancy that were grouped into ten themes: • traumatic events (e.g., sexual and physical abuse); • socioeconomic conditions (e.g., difficulty affording for adequate housing); • culture, identity, and spirituality (e.g., lack of cultural connection); • feelings of shame and guilt (e.g., difficulty asking for help); • well-being (e.g., multiple sources of stress to overcome); • family (e.g., level of family support); • romantic and platonic relationships (e.g., a supportive and present partner); • strength and hope (e.g., getting a job, going back to school); • motherhood (e.g., the fear of losing one's child); • the relationships between the different determinants. The participants also shared factors that helped them reduce or stop their use of alcohol and drugs. Social support, strong family ties, and certain traditional values associated with motherhood are examples. This reduction in their consumption has greatly contributed to their and their families' well-being.

Canada (continued)						
Authors and date	**Type of methodology**	**Population Recruitment Study period**	**Number of participants Age**	**Psychoactive substances Consumption measures**	**Social determinants**	**Relevant findings**
Rutman et al. (2005)	Qualitative Discussion groups	Indigenous women in British Columbia with addictions (who have experienced the removal of their children by social services or live in an Indigenous community) Not specified In general, and during pregnancy	14 women Age unknown	Self-reported alcohol and drug abuse problems	Colonialism Consumption habits Health systems	For the women interviewed, PAS use began occasionally in order to minimize psychological pain. However, this turned into self-destructive behaviour and polyconsumption. According to them, many Indigenous people who attended residential schools also use to minimize the pain that is passed on from one generation to the next. Participants noted that some women around them did not know they were pregnant until several months later. As a result, they consumed alcohol and drugs. They generally feel powerless in their interactions with health and social service providers. The model of complete abstinence that predominates in health systems makes them extremely vulnerable to failure. In their experience, even the tiniest deviation was reprimanded by practitioners and this rebuke was difficult for the women.

The United States						
Authors and date	**Type of methodology**	**Population** **Recruitment** **Study period**	**Number of participants** **Age**	**Psychoactive substances** **Consumption measures**	**Social determinants**	**Relevant findings**
Barlow et al. (2010)	Quantitative Cross-sectional study Self-evaluation questionnaire and semi-structured interview	Native American adolescents in Arizona During an intervention at home (Family Spirit) from June 2006 to May 2008 In general, and during pregnancy	322 women Average age: 17.6 years Teenagers	Alcohol and drug use (yes or no)	Cultural continuity Interpersonal violence Social environment Physical environments Employment and income Education level	Teenagers who agree with the importance of strong traditional Indigenous values are less likely to use drugs during pregnancy and have fewer family problems. There is a statistically significant relationship between parental history of alcohol problems and family history of suicide and drug use during pregnancy. Generally, adolescents who respond that their parents or guardians have a good idea of their interests have lower drug use. Participants who had lived in four or more homes in the previous year were twice as likely to use PAS during pregnancy as those who had lived in one home. The socioeconomic status (income and education level) of the sample varied little, so there was no statistically significant relationship between this determinant and PAS use.

The United States (continued)						
Authors and date	**Type of methodology**	**Population** **Recruitment** **Study period**	**Number of participants** **Age**	**Psychoactive substances** **Consumption measures**	**Social determinants**	**Relevant findings**
Bohn (2002)	Quantitative Prospective longitudinal study Prenatal chart review and questionnaire	Native American women living in urban settings During a third-trimester prenatal appointment at a health clinic During pregnancy	30 women Average age: 24.3 years Teenagers and adults	Alcohol and cannabis use (yes or no and frequency)	Interpersonal violence	There is a statistically significant relationship between having experienced sexual and physical abuse and PAS use prior to pregnancy. The authors did not identify a statistically significant relationship between individual and cumulative variables of abuse and PAS use during pregnancy. The number of physically and sexually abusive behaviours experienced by this sample is high. Violence by the partner during pregnancy is likely to occur in a more abusive relationship.
Hebert and Sarche (2021)	Quantitative Cross-sectional study Questionnaire	Native American women in five states (Alaska, New Mexico, Oklahoma, South Dakota, and Washington) As part of the Pregnancy Risk Assessment Monitoring System (PRAMS) from 2015 to 2017 In general, and during pregnancy	4,172 women 40% are under 24 years of age Teenagers and adults	Alcohol use (none, <1 drink per week, or ≥1 drink per week) Binge drinking (≥4 drinks in 2 hours)	Consumption habits Employment and income Education level Mental health and well-being Interpersonal violence Physical environment	For participants, there was no significant association between binge drinking three months before pregnancy and: • the state where they reside; • place of residence (rural or urban); • alcohol use during pregnancy. There was no significant association between sociodemographic factors (marital status, poverty, education) and alcohol use during pregnancy. Participants who report having symptoms of depression prior to pregnancy are at greater risk for alcohol use during pregnancy. Experiencing interpersonal violence before pregnancy is associated with an increased likelihood of drinking during pregnancy. Experiencing homelessness during pregnancy doubles the risk of alcohol use for that same period compared to women living in stable housing.

The United States (continued)						
Authors and date	**Type of methodology**	**Population** **Recruitment** **Study period**	**Number of participants** **Age**	**Psychoactive substances** **Consumption measures**	**Social determinants**	**Relevant findings**
Jorda et al. (2021)	Quantitative Prospective longitudinal study Questionnaires for up to three prenatal visits	Rural Tribal Nation in the central United States As part of the Safe Passage Study During pregnancy	421 women Average age: 24.7 years Teenagers and adults	Concurrent alcohol and tobacco use (yes or no)	Social environment Education level Employment and income Mental health and well-being	Women in this community who are less likely to drink and smoke during pregnancy: • live with someone; • have studied for 12 years or more; • have a job; • are not depressed.
Parker et al. (2010)	Quantitative Cross-sectional study with a control group Post-pregnancy questionnaire	Six Northern Plains Indian communities and one urban area in the Plains Test group: women who have been offered FASD screening for their child by clinics, schools, or social service agencies (Faser Project) Control group: women from these communities with a child who is developing within the norms In general, and during pregnancy	152 women (test group) 33 women (control group) Average age: 31.3 years Adults	Self-reported alcohol use problem	Education level Mental health and well-being	At the time of the study, participants in the test group: • are five times less likely to have a high school diploma than those in the control group; • have a drinking problem to a greater extent than the control group; • have a high level of psychological distress. For the test group, analyses indicate that severe psychological distress increases the odds of reporting a drinking problem by 2.5 times. When nuanced with the demographics of age and education, this result remains significant.

The United States (continued)						
Authors and date	**Type of methodology**	**Population** **Recruitment** **Study period**	**Number of participants** **Age**	**Psychoactive substances** **Consumption measures**	**Social determinants**	**Relevant findings**
Ye et al. (2020)	Quantitative Prospective longitudinal study Questionnaire	In the Northern Plains: 5 recruitment sites in North and South Dakota including two Native American Indian reservations As part of the Safe Passage Study 1 year before pregnancy until 1 month postpartum	2,124 women 364 are under the age of 20 Teenagers and adults	Alcohol use Binge drinking (≥4 standard drinks ≥1 occasion in the past 30 days)	Employment and income Physical environment	The socioeconomic status of the sample of Native American women in North and South Dakota is relatively consistent and in the lower category (low income and government assistance). There was no statistically significant association between these variables and alcohol consumption during pregnancy. Among Native American mothers who drank alcohol during pregnancy, these women drank excessively. Frequent relocation was the only significant risk factor for alcohol use and binge drinking during pregnancy among Indigenous mothers. 26% of the sample moved at least once in the past year. Frequent relocation could be associated with financial stress and lack of social support. A decrease in alcohol use was observed after the first trimester. Late recognition of the pregnancy could explain this decrease.

Australia						
Authors and date	**Type of methodology**	**Population** **Recruitment** **Study period**	**Number of participants** **Age**	**Psychoactive substances** **Consumption measures**	**Social determinants**	**Relevant findings**
Gibson et al. (2020)	Qualitative Focus group and individual interviews	Aboriginal and Torres Strait Islander women from two rural communities in the state of Victoria and the Northern Territory In two Community Controlled Health Services During pregnancy	14 women Age not mentioned Adults (18 years and older)	Alcohol use (not measured)	Social environment Interpersonal violence Mental health and well-being Cultural continuity	The Indigenous women interviewed mentioned that some women in remote Aboriginal communities are likely to be aware of the harms of alcohol use during pregnancy. However, abstinence may be difficult due to: • the social environment (partner, family, and social network); • mental health problems; • domestic violence issues. Participants noted that strong traditional Aboriginal values may be a protective factor against alcohol use during pregnancy.
Passey et al. (2014)	Quantitative Cross-sectional study Questionnaire	Aboriginal and Torres Strait Islander women in New South Wales and the Northern Territory In 22 of 28 Aboriginal Maternal and Infant Health Strategy centres from July to September 2010 and from April to June 2011 During pregnancy	257 women Average age: 23 years Adults (16 years and older)	Alcohol, tobacco, and cannabis use (yes or no)	Consumption habits Education level Health systems	During pregnancy, the vast majority of women who quit smoking cigarettes also stop drinking alcohol. Women who have never smoked are very unlikely to use alcohol and cannabis during pregnancy. Women who use one substance (tobacco, alcohol, or cannabis) during pregnancy are more likely to use a second substance. The likelihood of using two or more substances during pregnancy among women in the sample with 10 or 11 years of education is one third that of women with less than 10 years of education. Finally, while the majority of pregnant women are abstinent or use only one substance, those who report using multiple substances have fewer prenatal visits.

APPENDIX 3 SCIENTIFIC QUALITY

Authors and date	Overall rating	Preliminaries (/5)	Introduction (/5)	Design (/5)	Sampling (/5)	Data collection (/5)	Ethical matters (/5)	Results (/5)	Discussion (/5)
Québec – Nunavik									
Fortin M. et al. (2016)	88%	5	5	5	3	4	5	4	4
Fortin S. et al. (2012)	88%	5	5	5	3	4	4	4	5
Muckle et al. (2011)	85%	5	5	5	3	5	3	4	4
Canada									
Shahram et al. (2017a)	80%	4	5	4	3	4	4	4	4
Shahram et al. (2017b)	88%	5	5	3	4	3	5	4	5
Shahram et al. (2017c)	90%	5	5	5	4	4	4	4	5
Rutman et al. (2005)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
The United States									
Barlow et al. (2010)	75%	3	5	5	2	4	2	4	5
Bohn (2002)	66%	4	4	4	2	4	1	3	5
Hebert and Sarche (2021)	85%	5	5	4	4	3	4	4	5
Jorda et al. (2021)	75%	5	5	3	4	2	3	3	5
Parker et al. (2010)	68%	5	5	3	3	1	3	3	4
Ye et al. (2020)	78%	5	5	5	2	3	2	4	5
Australia									
Gibson et al. (2020)	75%	5	5	5	2	4	5	3	4
Passey et al. (2014)	83%	5	5	4	4	3	4	4	4

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