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The Role of Social Determinants on Substance Misuse and Cardiovascular Disease in Indigenous Communities: A Scoping Review

Sofia Beaucage, BA Student [1], Anaïs Miners, BA Student [1]*

[1] Department of Psychology, McGill University, Montreal, Quebec, Canada H3A 0G4

*Corresponding Author: anais.miners@mail.mcgill.ca

Abstract

Introduction: Cardiovascular disease (CVD) is the leading cause of death among Indigenous Peoples in Canada, who experience significantly higher rates of chronic illnesses compared to non-Indigenous populations. Despite this disparity, Indigenous communities remain underrepresented in CVD research, contributing to ongoing gaps in care and prevention. One major contributor is substance misuse (SM), which is both a consequence of intergenerational trauma and a key risk factor for CVD. This scoping review explores the social determinants that drive SM in Indigenous populations and contribute to their elevated CVD risk.

Methods: This scoping review synthesized peer-reviewed studies from major academic databases using MeSH (medical subject headings) terms related to Indigenous health, SM, CVD, and social determinants of health. It identified and categorized key social determinants influencing health outcomes in Indigenous populations in Canada, guided by the WHO framework and assessed for relevance and feasibility based on available data.

Results: Substance misuse among Indigenous communities is embedded in systemic, intergenerational, and structural inequities—many of which also elevate CVD risk. Three primary determinants emerged as most influential: (1) Historical trauma stemming from colonization, (2) barriers to healthcare quality, access and systemic discrimination, and (3) poverty and inadequate infrastructure. These interconnected factors contributed to different outcomes such as chronic stress, maladaptive coping strategies, and limited access to timely, quality care—all linked to poor cardiovascular health.

Discussion: Our findings reveal a critical need for research and policy that center on Indigenous perspectives and address the structural roots of health disparities. Interventions must move beyond individual-level treatments and engage with the broader sociohistorical context of colonization, historical trauma, and systemic exclusion.

Conclusion: Historical trauma, barriers to healthcare access and quality, built environment and poverty are central social determinants impacting SM and CVD in Canadian Indigenous populations. Long-term, ethical engagement with indigenous knowledge systems and community leadership is essential to achieving sustainable health equity.

Keywords: substance misuse; cardiovascular disease; social determinants; Indigenous; Canada; historical trauma

Introduction

Enduring centuries of suffering at the hands of their white oppressors, Indigenous Peoples have borne profound and enduring loss of loved ones, ancestral lands, and cultural heritage [1-3]. As a result of colonial practices like forced relocation and cultural suppression, Indigenous Peoples in Canada face the country's poorest health outcomes [4]. Compared to non-Indigenous populations, they experience higher rates of chronic illnesses, including heart disease, asthma, and cancer [5]. In 2018, 59.8% of First Nations individuals reported at least one chronic health condition; and life expectancy remains 11.2 years below the Canadian average, underscoring a persistent and significant health gap [4].

Cardiovascular disease (CVD) stands out as the leading cause of death among Indigenous Peoples in Canada [6]. CVD refers to a group of disorders affecting the heart and blood vessels, including ischemic heart disease, stroke, heart failure, and hypertension— with Indigenous populations being 10 to 75 times more likely to suffer than other demographics from these diseases [7, 8]. Between 2015 and 2017, 4.2% of First Nations and 3.6% of Inuit individuals were diagnosed with heart disease [9]. Indigenous Peoples also disproportionately account for 41% of Group A strep infections—a major cause of rheumatic heart disease [7].

These statistics not only highlight current health disparities but also demonstrates the need to examine underlying determinants. One key factor is substance misuse (SM), identified in multiple cohort studies as a major risk factor for developing and progressing CVD [8, 10, 11]. SM refers to the harmful or inappropriate use of substances such as alcohol, opioids, and stimulants [12]. This differs from substance use disorder (SUD), which the American Psychiatric Association (2022) defines as a condition characterized by intense cravings and a diminished ability to

limit repeated substance use despite serious negative consequences [13]. For this scoping review, both SM and SUD will be considered. Both legal and illicit substances have been associated with increased cardiovascular risk. One study found that individuals with SUD had more than double the prevalence of CVD compared to those without the disorder [8]. The causal mechanisms vary across substance types but share common physiological pathways that strain the cardiovascular system [14-19].

In Canada, about 25% of Indigenous communities face substance addiction, making it one of their most urgent health disparities [21, 22]. To address this health gap, this scoping review explores how social determinants contribute to SM and its link to CVD in Indigenous populations. This review applies the World Health Organization's Social Determinants of Health framework (2024) to examine the structural and systemic barriers contributing to poor health outcomes in Indigenous communities [23]. Three primary determinants emerged as focal points: (1) historical trauma and its intergenerational effects, (2) disparities in healthcare access and quality—including geographic isolation, educational inequities, and communication barriers—and (3) the built environment and socioeconomic conditions such as poverty, housing insecurity, and unemployment. This framework intends to highlight the societal factors influencing SUD and CVD risk and prevalence.

Methods

A comprehensive literature search was conducted across four electronic databases: PubMed, Google Scholar, PsycINFO, and Scopus—for articles published between 1993 and 2024. Boolean operators (AND/OR) were used to combine terms across concept categories in the search strategy. Articles were limited to English and French peer-reviewed publications involving human participants. In addition to peer-reviewed literature, select grey literature sources—including academic books, government agencies, Indigenous Services Canada and dissertations—were consulted to provide background theory and conceptual framing for the review. These sources were important for introducing and contextualizing complex topics such as historical trauma, colonial land displacement, and Indigenous frameworks of health and healing, which are often underrepresented in empirical, peer-reviewed research. Manual searches of reference lists from included papers were also performed to identify additional relevant studies.

The following social determinants of health were identified and evaluated for their contextual relevance to Indigenous communities in Canada, based on current data and the World Health Organization's Social Determinants of Health framework: (1) historical trauma and colonization, (2) healthcare access and quality, (3) geographic isolation, (4) access to education, (5) communication and language barriers, (6) housing and infrastructure, and (7) poverty and unemployment. Although this review was guided by the WHO framework, the included studies often presented overlapping or co-occurring determinants. For this reason, related themes were grouped to better reflect the complexity of Indigenous health inequities: (1) Historical Trauma, (2) Health care access and quality, (3) Built Environment and Poverty.

Furthermore, this review focused on Indigenous populations in Canada, including First Nations, Inuit, and Métis Peoples. While the primary scope was limited to Canada, select international studies were referenced for comparative and contextual purposes, particularly where they offered insight into global patterns in health service access or intervention strategies among Indigenous groups.

The search strategy combined Medical Subject Headings (MeSH) across four key concepts: Indigenous populations (e.g., "First Nations", "Inuit", "Métis"), substance use (e.g., "substance misuse", "addiction", "drug use"), cardiovascular disease (e.g., "CVD", "heart disease", "stroke"), and social determinants of health (e.g., "historical trauma", "poverty", "healthcare access"). Table 1 outlines the primary concepts and their associated synonyms.

Table 1. Key Search Terms and Synonyms

Concept	Search Term Used
Indigenous populations	"Indigenous", "First Nations", "Métis", "Inuit", "Aboriginal", "Canada"
Substance Use	"Substance misuse", "substance use disorder", "addiction", "drug use", "alcohol use", "opioid use", "tobacco use"
Cardiovascular disease	"Cardiovascular disease", "CVD", "heart disease", "stroke", "hypertension", "rheumatic heart disease"
Social Determinants of Health	"Social determinants of health", "historical trauma", "healthcare access", "poverty", "built environment", "education", "communication barriers", "colonialism", "intergenerational trauma"

The titles and abstract were screened by two independent reviewers to determine relevance and the inclusion criteria was developed prior to screening. The review included studies that focused on Indigenous populations in Canada, included discussion of one or more social determinants of health. Studies were excluded if they did not involve Indigenous populations, did not discuss relevant social determinants, or did not address substance misuse or cardiovascular outcomes. Articles published in languages other than English or French were also excluded. Discrepancies between reviewers during the screening process were resolved through discussion until consensus was reached.

For each study, the reviewers recorded the publication details, including the authors, year of publication, and journal name. They also documented information about the study population, such as the specific Indigenous group studied, and the geographic region within Canada. The form also captured which social determinants of health were addressed in each article, as well as the health outcomes examined—specifically whether the study focused on substance misuse, cardiovascular disease, or both. Finally, the reviewers extracted each study's key findings and their implications for understanding health disparities among Indigenous populations. Both reviewers participated in the data extraction process and compared results to ensure consistency. Any discrepancies were discussed and resolved collaboratively.

Results

1. Historical Trauma

Historical Trauma (HT) is a conceptual framework developed to describe the cumulative, multigenerational psychological and physiological impacts of collective traumatic experiences, such as colonization and systemic oppression [24, 25]. Originating in the mid-1990s, HT was initially framed as a culturally grounded, intergenerational form of Post-Traumatic Stress Disorder (PTSD), particularly in research on Native American communities in the United States [24, 25]. Hartmann et al. (2014) later articulated the "Four Cs" model of HT: (1) Colonial injury, (2) Collective experience, (3) Cumulative effects, and (4) Cross-generational impacts [26, 27]. Although the DSM-5 does not formally recognize HT as a PTSD subtype, its documented effects closely resemble trauma-related syndromes [28-31].

Broadly, research indicates that trauma can be transmitted intergenerationally, with descendants often exhibiting symptoms similar to those of the original victims [32-34]. This has been observed in Canada, where children exposed in utero to high levels of objective stress during the 1998 Québec Ice Storm scored lower on Full Scale IQ and Verbal IQ tests, and had weaker language abilities, compared to those with lower prenatal stress exposure [35]. Ramos (2011) further explained that HT can disrupt endocrine and immune function; and Hale (2012) linked chronic stress from HT to increased rates of diabetes in Indigenous communities [31, 36].

Expanding on this, Brave Heart (2003) argued that self-medication through SM is a common response to unresolved HT—behaviors that heighten CVD risk. Substance use thus serves as both a coping mechanism and a long-term health risk, reinforcing the cyclical nature of HT [25]. Walls (2023) added that family histories of forced relocation were tied to grandparental alcohol-related problems, which were in turn associated with depression and SM in the parental generation [37]. These intergenerational effects are compounded by feelings of inadequacy in parenting roles and a lack of culturally meaningful parental role models—an enduring consequence among residential school survivors and their descendants.

2. Health Care Access and Quality

2.1. Geographical location

Rural healthcare facilities pose significant barriers to adequate care, often due to understaffing and difficulty recruiting medical professionals to remote areas, leading to inadequate care [38, 39]. For Indigenous populations, geographic isolation (i.e., among many remote First Nations, Inuit, and Alaskan Native communities) further deepens health disparities and contributes to persistent gaps with non-Indigenous populations [7].

Smye et al. (2023) identified structural and relational barriers to mental health and substance use services for Indigenous Peoples in Canada, including the "detox paradox"—the limited availability and geographic reach of detox services, which are often mandatory for treatment and housing access [40]. Similarly, methadone maintenance therapy, a primary treatment for opioid use disorder, is geographically constrained, further limiting care [40].

Infrastructure challenges exacerbate these issues: with the absence of proximal hospitals, the lack of year-round road access and must rely on costly air travel, delaying care and harming health outcomes [7, 39]. Indigenous individuals with CVD living in Indigenous-dense regions often travel farther for cardiovascular care than those in less concentrated areas [7]. These burdens, especially for low-income households, restrict access to healthcare, education, and employment, as off-reserve care requires costly travel, accommodation, and time away from family—placing further strain on patients [39, 41].

2.2. Access to Education

A significant portion of Indigenous peoples continue to experience barriers to formal education, in part due to curricula lacking cultural relevance and sensitivity [39]. As a result, lower literacy levels can hinder individuals' ability to navigate complex healthcare systems, leading to delayed or inadequate medical care [39]. For Indigenous individuals living off-reserve, educational achievement has been identified as a critical factor influencing overall health outcomes [39]. Yet, substance misuse persists even among

those in higher education; a study of Canadian Indigenous post-secondary students found higher rates of suicidal ideation, self-harm, and substance use compared to their non-Indigenous peers [42].

2.3. Communication Barrier

Language barriers have been shown to prevent clear articulation of symptoms or concerns in Indigenous communities, in which health conditions may go unrecognized or untreated, further reinforcing disparities in healthcare access [39]. These challenges reflect a broader issue within Western healthcare systems—one that tends to frame Indigenous patients through a deficit-based lens, focusing on barriers rather than strengths—reinforcing negative narratives and systemic inequalities [43, 44]. Kennedy et al. (2022) emphasized the importance of a strengths-based approach in Indigenous healthcare that centers Indigenous knowledge, resilience, and collective well-being over deficit-based models [45].

3. Built Environment and Poverty

Indigenous populations in Canada face disproportionately high rates of homelessness—up to eight times higher than non-Indigenous populations—especially in urban and northern regions where they can represent 80–90% of the homeless population despite making up a small percentage of the general public [46-48]. For example, in northern cities such as Yellowknife and Whitehorse, Indigenous people comprised up to 90% of the homeless population, while in Toronto, where they represented only 0.5% of the general population, they accounted for approximately 15% of those experiencing homelessness [48]. Additionally, Indigenous communities in Arctic and Subarctic regions faced overcrowding and a critical shortage of affordable, adequate housing, further intensifying housing insecurity in these regions [48].

A study by Flewelling et al. (1993) examined the relationship between SM and family income levels and found that people from lower-income families were at a significantly higher risk of using crack cocaine and hallucinogens, as well as engaging in more frequent heavy use of marijuana and cocaine [49]. Notably, research has demonstrated a strong link between low income and higher smoking rates [45]. However, substance use appears to be more closely tied to the stress induced by structural vulnerabilities, such as unemployment, when compounded by financial hardship [50]. The intersection of poverty, mental illness, and SM renders many individuals—particularly those from marginalized communities—more vulnerable to homelessness [50]. For Indigenous populations, economic disparities linked to lower educational attainment and limited access to employment opportunities further exacerbate the challenges of urban living, increasing their susceptibility to housing insecurity [46]. Individuals experiencing severe SUD and/or mental illnesses are disproportionately represented in this group, constituting anywhere from 33% to over 60% of the overall homeless population [40].

Discussion

This scoping review examined the primary social determinants contributing to SM among Indigenous populations in Canada and their influence on the prevalence of CVD: historical trauma, healthcare access and quality, built environment and poverty. Altogether, our findings revealed that SM within Indigenous communities is not simply a matter of individual behaviour but is deeply rooted in systemic, intergenerational, and structural inequities shaped by colonization, and emphasizes the need for culturally responsive interventions.

First, HT emerged as a potent social determinant of SM and CVD, representing a biopsychosocial reality with measurable intergenerational consequences. Existing research demonstrated that the persistent impact of colonial violence continues to shape Indigenous health outcomes today by mirroring PTSD in both biological and psychological domains [30, 31]. This aligns with broader understandings of stress as a critical contributor to disease, with allostatic load—the cumulative physiological toll of chronic neuroendocrine activation—driving significant health complications like CVD [31, 51]. Substance use also often serves as a form of self-medication for unresolved trauma [25], and its chronic use contributes to physiological strain, heightening CVD risk [8] and reinforcing a harmful cycle of harsh parenting, insecure attachment, and increased vulnerability to SM [37]. These findings align with Olson and Dombrowski's (2019) argument that colonial disruptions fractured early-caregiver bonds, leading to maladaptive parenting and reliance on harmful coping mechanisms like SM [2]. In other words, SM and related health risks are often rooted in disrupted early caregiver bonds and insecure attachment, caused by a loss of cultural connection passed down through generations. Future research should further examine attachment styles as a consequence of HT and their role as key contributors to SM and SUD.

A promising advancement that can support this line of inquiry is the development of tools that reliably operationalize intergenerational trauma. For instance, Békés and Starrs (2024) have created the Historical Intergenerational Trauma Transmission Questionnaire (HITT-Q), an instrument that assesses both vulnerability and resilience associated with intergenerational trauma [51]. Incorporating such tools into clinical and research settings can enhance our understanding of HT's psychological and relational effects and can inform culturally grounded interventions.

Second, healthcare access and quality were examined through three key categories: geographical location, access to education, and communication barriers. Research specifically examining the relationship between geographic location and SM within Indigenous communities in Canada

remains limited. Overall, we found that rural healthcare infrastructure posed significant barriers for Indigenous communities, particularly in accessing substance use treatment [39, 38]. Many remote communities faced limited detox services, which are geographically restricted and difficult to access, creating what Smye et al. (2023) termed the detox paradox [40]. These barriers, with added long travel distances and financial constraints, made it harder for Indigenous individuals to receive timely and effective substance use care [39, 7].

Similar disparities are observed in the United States, where American Indian individuals are significantly less likely than non-Latino white participants to initiate and engage in outpatient SM treatment, especially in economically disadvantaged areas [52]. Conversely, a study of adolescents in Hawai'i found that rural isolation did not hinder treatment outcomes, with isolated youth showing comparable progress to their non-isolated peers [53]. These findings suggest that rurality alone may not predict treatment success. Future research should investigate how factors such as cultural relevance, treatment quality, community and family engagement influence SM treatment outcomes in geographically isolated Indigenous communities in Canada.

Regarding access to education and communication barriers, lower literacy levels and limited access to culturally relevant education continue to pose major barriers to healthcare access for Indigenous peoples, particularly those living off-reserve [39]. These educational disparities were linked to higher rates of substance use and poorer health outcomes. One key aspect salient to this issue was the Western healthcare system's tendency to approach Indigenous patients from a deficit-based perspective, which reinforces systemic inequities [45].

Similarly to what Kennedy et al. (2022) advocated through their call for strengths-based approaches in healthcare, a scoping review by Maina et al. (2020) expounding on school-based substance use prevention programs, revealed that programs are more impactful, effective, and sustainable when students are provided with relevant skills and knowledge to manage real-world substance use challenges—particularly when these programs are rooted in Indigenous traditions, languages, values, and worldviews [45, 54]. Grounded in the teachings of Elders, this perspective aligns with Etuaptmumk (Two-Eyed Seeing), which integrates both Indigenous and Western ways of knowing to promote holistic care [55]. By shifting the focus from disparities to strengths, healthcare professionals can honor Indigenous dignity, challenge colonial legacies in health systems, and work collaboratively toward meaningful, equity-driven change [45].

Third, the built environment plays a critical role in shaping health outcomes within Indigenous communities. Socioeconomic determinants—such as poverty, inadequate housing, and limited employment opportunities—intersect with systemic racism and barriers to education, creating structural vulnerabilities that increase the risk of SM. Although low income alone does not cause SM, the chronic stress it induces—especially when paired with social marginalization—leads to higher rates of smoking, alcohol abuse, and illicit drug use, all increasing risk for CVD [8, 14-20, 51, 52]. Another important reason for the overrepresentation of Indigenous Peoples in urban homelessness is the long history of land dispossession [56]. Canada was founded through a struggle over land, where settlers claimed Indigenous territories using both force and colonial ideologies to justify the seizure of Indigenous territories, resulting in widespread land loss and the forced relocation of Indigenous peoples to designated 'Indian reserves' [57]. This colonial way of organizing land reinforced a system of inequality and shaped ideologies about where Indigenous people and settlers belong [56]. This long history of marginalization and exclusion plays a crucial role in understanding why Indigenous communities occupy the social, economic, and geographic positions they do today. For instance, research by Kendall, J. (2001) demonstrated that Canadien Indigenous were dedicated less than 0.5% of the land area of the Northwest territories and the southern Yukon, despite comprising over 2.8% of Canada's population [56].

Moreover, even in cases when they do have land recognition, Indigenous communities frequently encounter substantial challenges in exercising control over these territories [56]. Environmental degradation has further compromised Indigenous lands, as exemplified by the destruction of the James Bay Cree habitat by Hydro-Québec and the damage to Mohawk territory at Akwesasne caused by hydroelectric development along the St. Lawrence [56]. Furthermore, the economic development and resource extraction yielded minimal benefit to Indigenous communities, perpetuating cycles of marginalization and economic disparity. The lack of a meaningful homeland continues to present a fundamental obstacle to both cultural sustainability and economic development among Indigenous peoples [56].

While this review offers a comprehensive overview of the social determinants contributing to SM and CVD among Indigenous populations in Canada, several limitations were apparent. First, there was a limited availability and scope of research on Indigenous health in Canada [7]. Second, much of the literature included in our scoping review was descriptive in nature, reflecting a broader gap in intervention-based studies. For instance, between 2001 and 2003, only 35 intervention studies on Indigenous health were published collectively across the United States, Canada, Australia, and New Zealand [58]. Increased emphasis on intervention-based research could better inform actionable strategies to improve health outcomes in Indigenous communities [58]. Third, the reviewed literature is largely rooted in a Western biomedical framework, often overlooking Indigenous

perspectives on trauma, illness, and healing. Furthermore, the review is limited in its representation of the full diversity of Indigenous communities in Canada. Given the vast number of distinct Nations and cultures, most research focuses on specific groups, making it difficult to generalize findings across all Indigenous populations. Lastly, as a scoping review, this study is not exhaustive. Although it highlights key themes in the current literature, it does not encompass all social determinants relevant to SM and CVD in Indigenous populations. Despite broad access through platforms like PubMed and Google Scholar, some relevant studies may have been excluded due to paywall restrictions or because they did not meet our inclusion criteria.

Conclusion

This review found that SM and CVD among Indigenous populations in Canada is deeply embedded in systemic, intergenerational, and structural inequities, including the enduring impacts of colonization. The results identified three primary social determinants—historical trauma, healthcare access and quality, built environment and poverty—collectively shaping both SM and CVD risk. HT was shown to disrupt early caregiving bonds and contribute to insecure attachment, which is strongly linked to maladaptive coping strategies like SM. Barriers such as geographical isolation, systematic bias in healthcare, and inadequate housing further compound these health risks and restrict access to treatment. Together, these findings underscore the pressing need for culturally grounded, community-led interventions.

List of Abbreviations

CVD: cardiovascular diseases
DSM-V: Diagnostic and Statistical Manual of Mental Disorders, 5th edition
HITT-Q: Historical Intergenerational Trauma Transmission Questionnaire
HT: historical trauma
MeSH: Medical Subject Headings
PTSD: posttraumatic stress disorder
RSS: residential school system
SM: substance misuse
SUD: substance use disorder

Conflicts of Interest

The authors declare they have no conflicts of interest.

Ethics Approval and/or Participant Consent

Ethics approval was not required because this review only sought to examine previously published research.

Authors' Contributions

AM: Contributed to the design and planning of the study, collected and analyzed data, drafted the manuscript, and gave final approval of the version to be published.

SB: Contributed to the design and planning of the study, collected and analyzed data, drafted the manuscript, and gave final approval of the version to be published.

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