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REVIEW ARTICLE

Prescription opioid prescribing, use/misuse, harms and treatment among Aboriginal people in Canada: a narrative review of available data and indicators

C Russell[1], M Firestone[2], L Kelly[3], C Mushquash[4], B Fischer[1]

[1]*Centre for Addiction and Mental Health, Toronto, Ontario, Canada*

[2]*Centre for Research on Inner City Health, Toronto, Ontario, Canada*

[3]*Sioux Lookout Meno Ya Win Health Centre, Sioux Lookout, Ontario, Canada*

[4]*Department of Psychology and Northern Ontario School of Medicine, Lakehead University, Thunder Bay, Ontario, Canada*

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Russell C, Firestone M, Kelly L, Mushquash C, Fischer B

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ABSTRACT

Introduction: Prescription opioid (PO) misuse and related harms are high in Canada, and a major public health challenge. In Canada, 1.4 million individuals (4.3% of the total population) self-identify as Aboriginal, among whom substance use and related harms are elevated. While there are reports of PO use and associated problems among Aboriginal groups, no comprehensive data review currently exists.

Methods: A review of available data sources (ie journal publications, public reports and 'grey' literature) was conducted following principles of a scoping review. Information and data were identified, extracted, and organized into major indicator categories: *PO prescribing/dispensing*, *use/abuse*, *morbidity/mortality harms and treatment*, and narratively reported.

Results: Data suggest that PO dispensing, use and misuse levels among Aboriginal populations are high and/or rising in select settings when compared to the general Canadian population. High levels of PO-related dependence and pregnancy harms exist (mainly in Northern Ontario); there is some indication of elevated opioid mortality among Aboriginals. Vast discrepancies in availability and access to interventions exist; some recent pilot studies suggest improved care.

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Conclusions: Data regarding PO use and harms among Aboriginal people are limited, even though elevated problem levels are indicated; improved monitoring, and more effective yet culturally and contextually appropriate interventions for this acute problem are needed.

Key words: Aboriginal, Canada, harms, misuse, prescription opioids, review.

Introduction

Prescription opioid (PO) misuse and related harms have been an acute and prominent public health challenge in Canada for some time. Canada has one of the highest levels of PO misuse, morbidity and mortality globally, set in the context of the second highest (after the USA) PO dispensing rates on a per capita basis[1-3]. Despite a variety of recent interventions on different (eg provincial) levels, some of the main PO-related problem indicators have continued to rise in Canada[4].

Canada is home to a substantial Aboriginal population of approximately 1.4 million people (4.3% of the total population), comprising diverse groups of self-identified First Nations (ie registered (status) and non-registered Indians), Métis and Inuit peoples. Canadian Aboriginal peoples have unique histories, traditions and languages as well as sociocultural and environmental diversity, encompassing more than 600 distinct communities with more than 60 languages[5,6]. Aboriginal people in Canada are mostly concentrated in Ontario and the Western provinces; their population, with children and youth comprising 46%, is growing rapidly[5,6].

Substance abuse and related harms are a major health and social problem in the Canadian Aboriginal population, at mostly elevated levels when compared to the general Canadian population[7-9]. For instance, 43.2% of First Nations adults living on-reserve (vs 19% in the general Canadian population) are daily smokers; similarly, rates of binge drinking are substantially higher[10]. Alcohol-related death rates are almost double (43.7 vs 23.6 per 100 000 in the general Canadian population)[11,12], and drug-related overdose rates are estimated to be two to five times higher[13]. Four in five First Nations adults on-reserve identified alcohol and drugs as the biggest challenges currently facing their communities[14]. Aboriginal youth cohorts are at between two and six times greater risk for every alcohol-related problem than their general population counterparts, and are more likely to use all types of illicit drugs[15]. However, of note, there can be substantial variability among Aboriginal communities, and homogeneity should not be assumed. Further, Aboriginal populations have faced generational abuse, trauma and both systemic and individual racism by way of colonial structures and experiences (such as the residential school system), which have been directly linked to adverse mental and physical health outcomes and directly or indirectly contributed to the elevated substance use/abuse rates among these populations[16-18].

Consistent with these patterns, sporadic indicators of PO misuse and harms have recently arisen as a distinct problem among Aboriginal populations[19,20], particularly in rural and remote locations in conjunction with acute challenges of limited access to related interventions or care[21-23]. However, comprehensive or systematic data on PO-related use, misuse or harms among the Aboriginal population are limited, inconsistent, or simply absent in Canada, partially due to the fact that Aboriginal populations are often excluded from national health surveys or health data information systems (which are regularly governed by jurisdictions or institutions different to those for general populations). Aboriginal populations are commonly not included in relevant survey sampling frames, and their heterogeneity and dispersed geographical placement further undermine their inclusion. Moreover, misclassification errors, non-response bias and a

lack of Aboriginal-specific identifiers can contribute to inconsistencies in existent survey data[24-26].

In this context, the main objective of this article was to compile and review available data indicators on PO prescribing and dispensing, use and misuse and related morbidity and mortality among Aboriginal populations in Canada, and hence to both assemble existent data as well as identify major data and information gaps in this important arena.

Methods

After identifying our topic of interest (ie PO prescribing/use/misuse and related harm indicators among Aboriginal populations in Canada), we searched relevant scientific literature databases (ie Google Scholar, ProQuest, PubMed, MEDLINE, JSTOR, EBSCO), conducted web-based searches to identify information from relevant websites, reports and other non-journal publications ('grey literature', eg from Statistics Canada, Health Canada, First Nations and Inuit Health Branch websites, publications, government/survey/technical reports, organizational and Aboriginal-specific publications) between August and November 2015, using variations on applicable search terms (ie *Aboriginal/Indigenous/First Nation/Métis/Inuit*, *prescription opioid/opiate*, *drug*, *substance*, *prescribing*, *disorder*, *prevalence*, *use/misuse/abuse*, *harms*, *overdose*, *mortality*, *morbidity*, *prevention*, *treatment*, *interventions*); in addition, we manually cross-referenced sources and references, and consulted with select topic experts who provided additional references and source leads. In line with a scoping/narrative review, we sought to find all relevant information on all possible key indicators and we did not place strict limitations on search terms or study designs to be included. All databases were searched one at a time using all variations on applicable search terms until all relevant data was extracted and the database had been exhausted.

Data inclusion criteria included all sources from 2000 to 2015 that contained any information on Canadian Aboriginal peoples and PO use and indicators of interest (including where information on POs may have been amalgamated with other psychoactive medication). Conversely, the scope of our review does not explicitly include information on non-POs (eg heroin); such information was excluded. Information was excluded also when more recent data/information was available (eg from a series of reports) or where information was non-quantitative. Once the literature was assembled, relevant data and information were identified, screened and extracted, organized and narratively presented in the major content categories: *PO prescribing and dispensing*; *PO use and misuse*; *PO-related morbidity and mortality harms and treatment and interventions* among Aboriginal populations in Canada. For the purposes of this review, the term 'Aboriginal' was inclusively used to refer to all status and non-status First Nations, Métis and Inuit peoples in Canada living both on- and off-reserve, and data were reported as such unless it was explicitly specified otherwise (eg only First Nations; on-reserve) in the respective information source. POs were defined as opioid analgesics available for prescription in Canada, unless the terms deviated or data were aggregated, in which case the specific term(s) were indicated (prescription pills, prescription and illicit drugs, etc.). Direct comparisons with non-Aboriginal populations were included where available.

Results

Prescribing and dispensing

Available data suggest elevated amounts of PO dispensing to Aboriginal recipients compared to the general Canadian population, with mostly rising trends; the data also suggest high rates of prescribing of strong PO formulations and multi-prescriptions. Specifically, the federal Non-Insured Health Benefits (NIHB) program provides essential health goods and services to approximately 800 000 eligible Aboriginal (ie status First Nations and Inuit but not non-status First Nations or Métis) people across Canada living on- and off-reserve; the NIHB client population (in 2013/2014) is considerably younger than the overall Canadian population with 34.7% (vs 22.1%) aged less than 20 years, fewer seniors

(≥65 years; 7.0% vs 15.7%), and an average age of 32 (vs 40) years[27]. In 2006/2007, the NIHB recorded 740 000 claims for PO prescriptions. Overall, annual PO claims increased to 933 000 by 2012/2013, constituting a 26% increase[19,28].

In 2012/2013, 'weak' POs (ie meperidine and codeine) accounted for 64.1% of NIHB opioid claims, while 'strong' POs (ie oxycodone and hydromorphone) accounted for 22.3%. Overall, 5.8% of all NIHB drug plan claims were made for POs (vs 2.4–4.3% in general population public drug plans)[28]. Approximately 2500 (0.3% of total eligible population) NIHB clients made concurrent claims for POs, benzodiazepines and methadone in 2013/2014. Claimants with more than 10 claims for POs accounted for 19.9% of all NIHB opioid claimants (vs 9.9–17.7% in general population plans) in 2012/2013. These high-use claimants accounted for the majority of PO claims costs and morphine equivalents dispensed; they were also more likely to receive higher-potency PO formulations[27,28]. There were 935 548 claims for PO agonists (eg Tylenol 3) in 2012/2013, which also accounted for the largest NIHB pharmacy expenditure (C$20,359,000)[27].

In addition to national patterns, there is evidence of regional variations in NIHB-based PO dispensing. Nearly 16 000 NIHB clients made a claim for an oxycodone formulation in 2006/2007; the majority (8200 or 51%) of these claimants were based in the province of Ontario, home to the largest percentage of NIHB clients in 2014 (197 092 or 24.4%)[27]. In addition, 56% of all Percocet and 49% of all OxyContin claimants were Ontario-based[19]. In 2007, 898 PO prescriptions were dispensed per 1000 eligible NIHB clients aged ≥15 years in Ontario; 119 per 1000 were for oxycodone formulations. The rate of NIHB clients in Ontario receiving PO prescriptions has remained relatively stable at around 20% (as of 2000–2009), yet the quantity of POs dispensed has increased[29].

Outside NIHB data, regional variations in PO prescribing exists. In Manitoba, levels of PO prescriptions and the prevalence of repeat PO prescriptions in 2006/2007 were found to be higher among Métis compared to all other Aboriginal and non-Aboriginal general population comparison groups. This difference was consistent by age and sex; however, no significant differences in the amount of POs dispensed (measured in daily defined doses) emerged[30]. Specifically, 20.8% of Métis had a prescription for one or more POs (vs 15.3%) and 7.7% of Métis had repeat (ie three or more in the past year) prescriptions (vs 4.4%)[30]. In the city of Winnipeg, 22.7% of Métis aged ≥16 years had one or more PO prescriptions (vs 15.8%) and 8.4% had repeat prescriptions.

NIHB-eligible First Nations populations in Alberta feature among the highest PO utilization across Canada, with codeine combinations identified as the most frequently dispensed PO formulation[31-33]. Conversely, all Atlantic provinces (New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland and Labrador) reported a decrease in PO claims between 2009 and 2013; 10% of NIHB-eligible Atlantic region First Nation residents aged ≥15 years made a PO claim in 2013[34].

Use and misuse

Some indicators of PO use and misuse are available for select Aboriginal subpopulations, indicating somewhat higher rates for Aboriginals compared to general populations, although markedly higher rates have been reported for select (local) communities. Nationally, 4.7% of on-reserve First Nations adults aged ≥18 years and 1.3% of youth aged 12–17 years reported past-year non-prescription use of POs in 2010; correspondingly, 5% of on-reserve First Nations adults with at least one chronic health condition (vs 3.6% without) reported non-prescription use of POs[14].

Based on Health Canada's 2008/2009 National Youth Smoking Survey, PO use among a total of 2620 off-reserve Aboriginal youth was found to be more common than among the general Canadian youth population and 'abuse of prescription painkillers was five times greater among Inuit youth compared to non-Aboriginal youth'[35]. Rates were also higher among female and older youth[36]. The prevalence of prescription drug (including POs as well as sedatives and

stimulants) use 'to get high' among off-reserve Aboriginal youth was 10.6% (vs 5.9% non-Aboriginal); specific rates for Aboriginal subgroups were 18.4% among Inuit, 11% among First Nations and 8.8% among Métis[36].

The use and misuse of POs has been found to vary by province and region, with some (eg remote or Northern) communities reporting increases and higher levels compared to general populations. In Ontario's North East Local Health Integration Network (including 41 First Nations and 19 urban and rural Aboriginal communities) higher rates of prescription and illicit drug use among Aboriginal people have been found[37]. In 2009, the Nishnawbe Aski Nation (comprising 49 smaller Northern Ontario reserve communities with a population of approximately 45 000) declared a 'state of emergency' due to widespread PO misuse[38]. In some of this Nation's communities, 50–80% of the adult population, and up to 50% of youth, misuse POs and require treatment[39,40]. In 2012, the Matawa First Nation (comprising nine Nishnawbe Aski Nation communities) estimated that approximately 2000 people (of a total on-reserve population of 4912) were addicted to POs[41]. Constance Lake First Nation reported that 46% of community members admitted to abusing POs[42]. Other individual reserve communities (mostly 'fly-in' only, ie reachable only by air transportation) have also witnessed increases in PO misuse[43]. For example, both Eabametoong and Cat Lake First Nation declared a 'state of emergency' due to an estimated 70% of community members, ranging in age from 11 to ≥60 years, abusing POs and consequent major social disruption (including crime, child neglect, loss of employment or economic functioning at a community level)[35,41,42].

Elevated levels of PO use and misuse among Aboriginal populations are also prevalent in non-reserve contexts. In the city of Hamilton, Ontario, 19% of a total of 554 self-identified First Nations adults reported PO use (including codeine, morphine, oxycodone and fentanyl formulations) within the previous year[44]. In Calgary, Alberta, 48% (n=144) of Aboriginal patients accessing addiction treatment through Native Addiction Services in 2000 reported inappropriate (mainly sedatives, relaxants and POs) medication use. Of those, 47% did so more than 10 times in the previous year; 41% obtained their medication from a physician[45]. A secondary analysis compared rates of prescription drug abuse in Alberta, specifically among a sample (n=103) of illicit opioid users in inner-city Edmonton comprising and assessed as Edmonton-based subsamples from two other multi-site street drug-user studies. Nine in ten (>90%) of off-reserve First Nations respondents in both samples reported prescription drug abuse – most commonly POs (eg OxyContin, Dilaudid and Tylenol 3,4) – in the previous 30 days[46]. In a sample (n=381) of urban Aboriginal adults in Edmonton, 24.8% reported past-year prescription drug abuse, with more than half (13.8%) involving POs; 69.5% of PO abusers acquired their POs through prescriptions[47]. Prescription drug abuse was lower among First Nations and Métis students in Edmonton compared to First Nations and Métis student respondents from other areas of the province in the previous 12 months (6.9% vs 8.2%) as well as by lifetime (2.1% vs 6.8%)[46]. Furthermore, the 2008 Alberta Youth Experience Survey, measuring psychoactive drug use among grade 7–12 students (n=3469), found that 24.1% of off-reserve Aboriginal students (vs 16.8% non-Aboriginal students) reported ever using illicit prescription drugs. Specifically, 21.5% of Aboriginal students (vs 15.1%) reported past-year use of codeine formulations; of these, the largest proportion (39.7%) reported using one or two times, while 27.7% reported using more than 10 times[48].

Combined data from provincial youth health surveys conducted in British Columbia (BC) in 1992, 1998 and 2003 involving more than 4800 Aboriginal youth found that 11% of urban respondents had lifetime non-prescription use of prescription pills. A repeat survey (2008) involving more than 3000 Aboriginal youth found that 22% reported non-prescription pill use. Rates for on-reserve Aboriginal youth were even more elevated, with 13% reporting lifetime non-medical prescription pill use in 2003; this number had increased to 28% by 2008, including higher rates among females (24%) compared to males (19%)[49,50]. Another province-wide health survey of Aboriginal youth living on and off-reserve in BC (n=410) found that 11% reported any

prescription drug use (past month), while 4% reported use the day prior to the survey[51]. The 2008 BC Adolescent Health Survey showed 23% of self-identified Métis youth aged 12–19 years who were enrolled in the public-school system reported ever trying non-prescribed prescription pills[52].

Morbidity and mortality

Pregnancy-related opioid misuse and harms: Various studies, mainly from Northern Ontario, have reported disproportionately high, and rising, levels of PO-exposed pregnancies, and related complications, primarily among First Nations women. In Northern Ontario's Sioux Lookout Meno Ya Win Health Centre (SLMHC) – which provides health care to approximately 28 000 First Nations patients in the region including women flown in from remote reserves for delivery – overall PO (mostly oxycodone) exposure in pregnancy increased from 13% in 2009 to greater than 26% in 2014[53,54]. Among narcotic-exposed pregnancies during 2010–2013, about half (48%) of the pregnant women who had used illicit narcotics reported binge use several times a month, while 46.5% of patients reported daily use of narcotics, which was a shift from predominantly occasional use in 2009–2010; route of administration shifted to intravenous use among some (30%), and became similarly common to snorting (32%)[21,55].

In 2009–2010, 61 neonates out of a total (primarily First Nation) 482 live births in the SLMHC were exposed in utero to oxycodone. The incidence of oxycodone exposure during pregnancy tripled from 8.6% (2009) to 28.6% (2013), with more than four out of five cases related to oxycodone formulations[39,55,56]. Rates of births involving neonatal abstinence syndrome in the SLMHC have simultaneously increased. Neonatal abstinence syndrome incidence rose from 4.4% of all births in 2010 to 5.3% in 2014, but was much higher in PO-exposed pregnancies[53]. Among infants exposed to opioids in utero, the rate of neonatal abstinence syndrome was 66% among daily opioid-using mothers in 2010[56]. About 20% of births among First Nations women (vs 5.6% of in the general population) in Canada were born to teenage mothers in 2000; rates of neonatal abstinence syndrome have been found to be five times greater (9.2 vs 1.6 per 1000 hospital births) among infants born to teenage mothers compared to mothers older at first delivery[23,57,58].

Emergency room hospitalizations, accidents, overdoses: As for other key indicators of morbidity, there were 12.1 emergency room visits per 10 000 First Nations people related to narcotic-specific withdrawal, overdose, intoxication, psychosis and harmful use in 2008/2009 in a sample of Ontario-based community hospitals; by 2010/2011, this rate increased four times to 55 per 10 000[59]. On-reserve (vs off-reserve) motor vehicle collisions in Saskatchewan between 2003 and 2005 were more likely to include multiple collisions and result in severe injuries. Individuals involved in on-reserve motor vehicle collisions were more likely to feature substance use, with rates for prescription or illicit drug use 3.75 times greater than for those involved in off-reserve motor vehicle collisions[60,61]. Among a total of 87 Aboriginal motor vehicle collision-related fatalities in BC between 2003 and 2005, drug use was considered a primary contributing risk factor in 16.9%[62].

In BC, 11.4% of the total 909 overdose deaths in the period 2001–2005 were among First Nations individuals. Opioids (including but not limited to POs) were detected in 48.1% of the deaths[13].

Treatment and other interventions

Aboriginal communities, especially on-reserve, have traditionally experienced extreme shortages and access problems for substance abuse treatment (including, but not limited to, PO disorders)[19,63,64]. Treatment initiatives and availability – with specific tailoring for distinct populations and settings – for programs targeting PO abuse among Aboriginal peoples in Canada have been expanding, although many communities (particularly Northern and remote ones) still face barriers to availability and access. These communities often have limited access to healthcare services; where these services exist, long wait lists are common and many individuals have to travel outside of their home communities to access treatment[19,65,66]. Thousands of First

Nations individuals among a base population of 25 000 were estimated to be in need of treatment for PO-related addiction in Northern Ontario[39,41,67]. A study among urban Aboriginal youth aged 14–30 years (n=397) in BC using opioids showed that only 23.4% had ever accessed methadone maintenance treatment, a standard opioid maintenance treatment; the majority (54.3%) of daily opioid-injecting participants had never received methadone maintenance treatment[68].

The National Native Alcohol and Drug Abuse Program – which provides on-reserve culturally based addiction services to 58 centers and administers more than 550 community-based prevention programs across Canada – reported an increase in cases citing prescription drugs as the primary substance of abuse, from 24.8% of all program clients in 2008/2009 to 45% in 2013/2014 in the Atlantic region[34,69,70]. Approximately 300 First Nations individuals living on- and off-reserve received addiction treatment services for prescription opioid-related problems in the two Northern Ontario Local Health Integration Networks in 2004/2005; this number had increased to 901 by 2008/2009[22,71]. NIHB claims for opioid dependence treatment medications (eg methadone) had the highest claims incidence among the major NIHB therapeutic classes, totaling C$1,222,720 in 2013/2014[27]. The number of NIHB claimants for methadone increased from 598 in 2000 to 6,038 in 2011 (23% annualized growth rate). The number of NIHB clients making claims for Suboxone, a newer opioid treatment medication, has increased from 41 in 2011 to approximately 750 in 2012[23].

Recently, various pilot programs for PO dependence have been implemented principally in remote and Northern communities to address the lack of available treatment options. In a pilot study in a Nishnawbe Aski Nation community examining the feasibility of a community-based Suboxone taper-to-low-dose maintenance program in a sample of PO-dependent First Nations adults (n=22), 95% completed the program's taper phase and 88% had no evidence of PO use 30 days post-treatment initiation[39]. In the SLMHC, a year-long program evaluation of the Medical Withdrawal Support Service, involving inpatient opioid-detoxification with Suboxone, reported that 81% of clients (primarily First Nations individuals) successfully completed the program; 30% remained abstinent at 6-month follow-up[71].

The Dennis Franklin Cromarty High School in Thunder Bay, Ontario (offering residential schooling for grades 9–12 students from 24 remote First Nations communities) initiated a unique opioid-detoxification pilot initiative with integrated clinical, cultural and psycho-educational support for students with PO misuse. Of the 33 students enrolled, 22 (63%) were opioid-free at the end of the tapering period. Further, most students experiencing relapses continued to successfully finish their treatment cycle; 14 students engaged in Suboxone-maintenance for up to 6 months[72].

Other pilot programs and treatment interventions have shown success beyond rates of abstinence. In 2014, 140 self-referred First Nations patients (20–50 years) were enrolled in an outpatient Suboxone substitution program in North-Western Ontario's North Caribou Lake First Nation community. There, criminal or drug charges, including those involving youth, decreased by more than 60%; the needle distribution program dispensed less than half its previous volume, and school attendance increased in the year following program implementation[43].

While neonatal abstinence syndrome rates increased within Northern Ontario's SLMHC overall between 2010 and 2013, a pilot opioid-tapering program featuring maternal long-acting morphine provision resulted in a decrease (from 30% in 2010 to 18% in 2013) in neonatal abstinence syndrome prevalence in opioid-exposed pregnancies among mothers who enrolled in the program. Of the 166 narcotic-using First Nations women at the SLMHC, half (52%) agreed to participate; by the time of delivery, 9% had quit and 83% had decreased their dose, although half still used oxycodone at least occasionally[73]. As of 2014, the rate of NAS appears to have stabilized at approximately 20% of narcotic-exposed pregnancies in the SLMHC[53]. These community-based opioid-substitution programs have now been implemented in 16 of the 30 First Nations communities in the SLMHC

catchment area[53]. In addition to these opioid-substitution therapy programs, many First Nations communities have developed and implemented culture-based and/or land-based interventions specifically designed for their community members[74]. To further address PO-related concerns in Northern Ontario's SLMHC, 20 physicians participated in a pilot educational intervention, resulting in a substantial reduction in physicians' concerns about getting patients addicted to POs; in-depth interviews confirmed that safer PO prescribing practices had occurred following the intervention[75].

Discussion

In the context of recently high levels of PO misuse and related harms across general and special risk (eg street-involved) populations throughout Canada, we examined available data and indicators for Aboriginal populations[1,3,4].

A first observation is that data on PO misuse and related harms among Aboriginal populations are extremely limited, largely fragmented and inconsistent; available data are mostly ad hoc or cross-sectional snapshots that allow for little examination of over-time trends or comparisons within Aboriginal or with non-Aboriginal populations. In this respect, the data situation on PO-related indicators among Aboriginals may be considered worse than that for the general Canadian population, where grave deficiencies in systematic documentation and monitoring exist[3]. Given the acuteness of the phenomenon under study, indicators on PO-related misuse and harms urgently need to be added to the essential health data. For these health indicators to be improved, better, more rigorous and consistent data and monitoring among Aboriginal populations are urgently required[24,25,76].

From the limited body of data available, the evidence suggests that PO misuse and harms among Aboriginal people in Canada are high (commonly higher than general populations) and have been rising in the select contexts where such assessments are possible. This includes the extreme examples of PO misuse or PO-related morbidity (eg regarding dependence or pregnancy-related problems) in Northern Ontario, where large proportions of entire communities or subpopulations have been severely afflicted by the harms of PO-related problems, but also extends to other settings[19,20,38,66]. This picture resembles the overall situation of substance use and acute or chronic harms among Aboriginal people, where predominantly higher levels (eg than general populations) have been observed across different substance categories[8,10,11,77]. Notably, most available problem indicators (regarding PO misuse or harms) are from (mostly Northern) Ontario and, to some extent, from Alberta, BC or Manitoba, whereas there is little information from other regions. While these reflect the regions with higher concentrations of Aboriginal peoples in Canada, it is not clear whether problems elsewhere are truly lower in occurrence or simply less documented.

Our data review can be considered positivist in nature and is largely limited to quantitative measures that do not consider the quality of data, methods or contexts in which these data were collected; in addition, our particular scoping/narrative approach to the research may have missed relevant information. Beyond these possible methodological constraints, the specific socioeconomic and cultural contexts of substance use among Aboriginal people need to be taken into consideration, although the extent of these complex interactions is beyond the scope of this article. It is well documented that substance use and its harm outcomes among Aboriginal people are crucially linked with the larger determinants of health, specifically the rampant health inequities, colonization, generational abuse and trauma, cultural suppression, poverty, unemployment, individual and systemic racism, and overall marginalization that uniquely characterize Aboriginal populations in Canada[7,16-18,77-80]. While the interplay of these historical or ecological determinants and harms for substances like alcohol (but also other substances) have been fairly well examined[8,12,81], this is less the case for psychotropic prescription drugs. In this wider context, POs may constitute a special case study that warrants attention; also in that a large proportion of the extensive amounts of POs consumed – and implicated in the

problems documented – among Aboriginal peoples has been actively prescribed to them by their (governmental) healthcare providers (ie the institutions mandated to care for their health)[27,74,78,82].

In addition, yet directly related, are extensive needs and deficiencies in interventions (eg specialized treatment for substance use disorders as well as many other health problems). These shortcomings have been uniquely severe in some contexts (eg in Northern Ontario communities, where large numbers of people require care for PO-related problems but interventions are categorically unavailable or inaccessible)[63,66,83]. This, again, reflects aspects of the general situation of highly limited and inadequate healthcare services among Aboriginal populations. While addressing these deficiencies first and foremost requires resources, these also need to be based on culturally appropriate approaches for which illustrative examples exist[70,74,84-86]. On this basis, there are some positive examples of effective implementation or expansions of (innovative or tailored) interventions for PO-related misuse and harms among Aboriginal people, specifically in Northern Ontario settings, including community-based opioid substitution treatment programs or medication-supported opioid tapering for pregnant women[39,43,71-73]. Yet, there are also concerns regarding the long-term and intrusive nature of opioid substitution therapy among Aboriginal patients, especially young patients[87]. Clearly, much more is necessary in terms of implementation and interventions that are sensitively framed and undertaken within the above principles crucial for and unique to Aboriginal populations. While there are numerous social and health intervention priorities (eg housing, education, chronic diseases) for Aboriginal peoples in Canada that urgently need to be addressed by effective policy programs, the problem of PO misuse and harms is an acute and major issue that should be included in a comprehensive action program.

Conclusions

This review found limited indicators of high levels of PO misuse and problems among Aboriginal populations in Canada. Much-improved data and monitoring (eg through system inclusion of Aboriginal populations in relevant large-scale survey samples), and culturally and contextually appropriate as well as evaluated interventions, are urgently needed for this acute problem in one of the main high-risk populations for substance use and harms characterized by pronounced health inequities.

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