

# Problematic Opioid Use: A Scoping Literature Review of Profiles

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## ABSTRACT

**BACKGROUND AND OBJECTIVES:** Problematic opioid use can be defined as opioid use behaviors leading to social, medical, or psychological consequences. In some instances, people presenting problematic opioid use can also meet criteria for an opioid use disorder. A growing body of literature highlights different types of people who use opioids, with contrasting characteristics and initiation patterns. In recent years, dynamic trends in opioid use have been documented and studies have demonstrated a shift in profiles.

**METHODS:** A scoping literature review was conducted to identify profiles of people presenting problematic opioid use, in order to support the development of tailored interventions and services.

**RESULTS:** Nine articles met the inclusion criteria. Five classifications emerge from the literature reviewed to distinguish types of people presenting problematic opioid use, according to: (1) the type of opioids used, (2) the route of opioid administration, (3) the level of quality of life, (4) patterns of other drugs used, and (5) dependence severity. While samples, concepts, and measurement tools vary between studies, the most salient finding might be the distinct profile of people presenting problematic use of pharmaceutical-type opioids.

**DISCUSSION AND CONCLUSIONS:** This scoping review highlights that few studies address distinctive profiles of people presenting problematic opioid use. Geographical and chronological differences suggest that local timely assessments may be needed to tailor the service offer to specific needs.

**SCIENTIFIC SIGNIFICANCE:** Future studies should focus on providing a deep understanding of distinct experiential perspectives and service needs, through exploratory quantitative and qualitative designs.

**KEYWORDS:** Opioid, problematic use, profiles, comorbidities, characteristics

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## Introduction

Opioids include pharmaceutical drugs such as morphine, codeine, fentanyl, or methadone, as well as illicit substances such as heroin. Pharmaceutical opioids are obtained through prescription, but they may also be diverted or counterfeit. Problematic opioid use can be defined as opioid use behaviors leading to social, medical, or psychological consequences.<sup>1</sup> In some cases, people presenting problematic opioid use can also meet criteria for an opioid use disorder (OUD).<sup>1</sup> The American Psychiatric Association<sup>2</sup> describes OUD as “compulsive, prolonged self-administration of opioid substances that are used for no legitimate medical purpose or, if another medical condition is present that requires opioid treatment, that are used in doses greatly in excess of the amount needed for that medical condition.” For the purpose of this article, the term “problematic opioid use” is operationalized to encompass the spectrum from opioid misuse to opioid use disorder (OUD).<sup>3</sup>

Dynamic trends in opioid availability and deleterious consequences have been documented during the last 2 decades in countries from the Organisation for Economic Co-operation

and Development.<sup>4</sup> In 2019, 1.2% of the world population has used opioids for non-medical purposes.<sup>5</sup> Increases in opioid overdose deaths have been documented in many western countries such as the United States, Canada, and Australia.<sup>6–9</sup> In 2016, the United States’ Center for Disease Control and Prevention reported a 200% increase in the rate of overdose deaths involving opioids since 2000.<sup>8</sup> In Canada, the government reported 3987 apparent opioid-related deaths in 2017.<sup>10</sup> In Victoria (Australia) the rate of opioid-related deaths was 3.6 per 100 000 in 2012.<sup>9</sup> Although the European Union is not considered to be facing an overdose opioid crisis like North America,<sup>11</sup> 76% out of the 5700 drug-induced deaths reported in 2019 involved opioids, mainly heroin or its metabolites.<sup>12</sup> In Europe, record quantities of heroin were seized in 2019, while seizures of “pharmaceutical opioids” peaked worldwide.<sup>5</sup>

Opioid prescribing practices had an impact on the unfolding of what is referred to as the “opioid crisis.” The first decade of the new millennium was marked by increasing levels of prescription opioid use, notably in North America and Australia.<sup>13,14</sup> In reaction to the rise in prescription opioid use and associated overdose



deaths, strategies to control the opioid crisis were implemented throughout the 2010s. But while restricting supply and influencing prescribing practices showed results in terms of preventing addiction,<sup>15</sup> it also “contributed to a burgeoning use of illicit opioids” for those who were already addicted to prescription opioids.<sup>16</sup> In addition, the emergence of highly potent opioids such as fentanyl on the illegal market, contributed to the rise of overdose deaths in Canada and the United States.<sup>17</sup> In sum, decreased numbers of prescribed opioids was not paralleled by a similar trend in numbers of opioid overdose deaths,<sup>18</sup> which continued to increase in North America during the COVID-19 pandemic.<sup>19,20</sup> In Canada, 1705 overdose deaths were reported from July 2020 to September 2020, rendering this quarterly count the highest since the beginning of national surveillance in 2016.<sup>21</sup> Such increases have been attributed to transformations in the illegal drug market (access, price, and quality) and reduced access to services.<sup>13</sup>

While the prevalence of problematic opioid use and OUD varies between countries, OUD treatment rates also vary. In the United States, the prevalence of heroin use and non-medical prescription opioid use was estimated respectively at 0.3% and 3.6% in 2018, for people age 12 or older.<sup>22</sup> Treatment rate was evaluated at 21.5% between 2009 and 2013.<sup>23</sup> In Canada, the latest estimates establish overall problematic opioid use at 0.3% for people age 15 or older<sup>10</sup> and OUD treatment rate was evaluated at 44% in Montreal city in 2016.<sup>24</sup> According to international standards, a coverage rate between 30% and 50% is not considered high, hence the need to reach a larger proportion of persons in need of treatment in North America.<sup>25</sup> Many socio-economic barriers can impede access to OUD treatment at the patient level, such as lack of transportation, unstable housing, or absence of childcare services.<sup>26</sup> At the professional and organizational level, other obstacles are reported such as inadequate professional training, dearth of addiction specialists, and “inadequate attention to developing systems of care that are centered around patient needs.”<sup>27</sup> Addressing these barriers may require a better understanding of different profiles of people presenting problematic opioid use.

People with OUD present high levels of comorbidities. For example, recent studies report chronic pain in 48% to 64% of patients in samples receiving opioid agonist treatment.<sup>28–32</sup> Additionally, the prevalence of mental health disorders in subjects with OUD is estimated around 64%.<sup>31</sup> Furthermore, co-occurring substance use disorders of other drugs is common among people with OUD.<sup>33</sup> For example, the most prevalent misused non-opioid substances reported in a large sample of patients in opioid agonist treatment are marijuana (39%), anti-anxiety medication (33%), and crack or cocaine (24%).<sup>34</sup> Other characteristics such as low employment rates and high rates of criminal charges have been reported to be associated with OUD at opioid agonist treatment (OAT) entry.<sup>35–38</sup>

In medicine, tailored services for different patient profiles have existed for millennia and profiling practices allow for adapting care to subpopulations with different needs or capacities.<sup>39</sup> In the field of OUD treatment, differential care has emerged

during the last decades, mostly in the form of high and low threshold services. More specifically, low-threshold programs are designed to reduce barriers to access and retention for patients with low adherence, parallel drug use or difficulty following program rules.<sup>40</sup> However, in the past few years, studies have started to identify new profiles of people presenting problematic opioid use. For instance, difficulties related to heroin use are no longer an urban and minority populations’ issue, for they now extend to prescription opioid misuse in the middle-class outside urban areas.<sup>41</sup> Others argue that with increasing use of prescription opioids, it is important to understand new characteristics and treatment needs that may differ from those of the more traditional profiles.<sup>42–44</sup>

Overall, in North America, the shift in profiles of people presenting problematic opioid use calls for a better understanding of the characteristics of new clientele and their specific service needs. This is especially relevant in the context of a service offer that has yet to reach the international coverage rate standards. This article reviews the literature to identify existing classifications of people presenting problematic opioid use, in order to support the targeting of specific service needs and the development of tailored interventions.

## Methods

A scoping review was conducted to assess the range of available knowledge on classifications of people presenting problematic opioid use and identify research gaps. Scoping reviews are useful to determine the extent of the literature on a given topic as well as to identify gaps in the existing literature.<sup>45,46</sup> The scoping review method thus appears relevant to address an emergent phenomenon such as the shift in profiles of people presenting problematic opioid use.

### *Search strategy and study selection*

Articles were identified using the Scopus database, which encompasses around 23 000 journals and includes PubMed and Medline.<sup>47</sup> The search was developed in collaboration with an experienced librarian and involved the following keywords:

*(Opioid\* OR opiate\*) W/2 (use\* OR disorder\* OR misuse\* OR dependan\* OR abuse\* OR addict\*) AND (class\* OR type\* OR typolog\* OR category\* OR profil\* OR subtype\* OR pattern\* OR characteristic\*) W/3 (use\* OR user\* OR usage\* OR patient\* OR consumer OR population).*

The literature search was conducted to identify studies that met the following inclusion criteria: written in English or French; proposing a classification of people presenting problematic opioid use (including OUD); published in peer-reviewed journals. Only studies conducted in Western countries were included, because there is much disparity between countries with respect to the management of OUD and availability of OAT. Overall, the western countries share some common characteristics in terms of health care systems, approaches to treatment, and availability of OAT.<sup>5</sup>

Only articles published as of 2008 were included, in order to include profiles reflecting the “changing face of opioid addiction,”<sup>48</sup> a phenomena that started to be highlighted during the end of the new millennium’s first decade. The search was conducted in the beginning of 2021, thus included articles published up to 2020.

### Data charting

Inspired by Arksey and O’Malley’s<sup>46</sup> framework for scoping reviews, the data extraction process was carried out by charting key information: sample, study design, measures, analysis, and key findings.<sup>46</sup> Results are summarized in Table 1.

## Results

### Overview of selected studies

The initial search led to the identification of 2043 studies, of which 9 met the inclusion criteria (ie, published between 2008 and 2020; conducted in Western countries; written in English or French; proposing a classification of people presenting problematic opioid use [including OUD]; published in peer-reviewed journals). Figure 1 illustrates the process of identification, screening and inclusion of articles.

*Samples and methods.* Five studies were conducted in the United States, 2 in Australia, 1 in Canada, and 1 in Belgium. Seven studies use samples of OUD patients from OAT programs. One study uses a subsample of people who use non-medical prescription opioids (NMPO) and heroin in a national survey database. One study uses data from a cohort study of people who use opioids and other illegal drug. Samples vary between 159 and 19 101 participants.

All samples are composed of people who present a problematic use of opioids, obtained legally or illegally. But while some samples are composed of clinical OUD populations in treatment, other samples (from national surveys and cohort study) comprise people presenting problematic opioid use, without necessarily having an OUD diagnosis.

Two-third of the studies (6) compare participants based on the types of opioid used, building on previous evidence that there may be significant differences between populations who use heroin and populations who use pharmaceutical opioids (prescribed, diverted, or counterfeit). Among these studies, one also compares 2 subgroups according to the presence or absence of injection, based on previous evidence of differences in clinical characteristics of individual depending on route of use. Another one uses latent class analysis to highlight differences in risk and initiation patterns.

One study compares subgroups according to classes of quality of life as an outcome of methadone treatment (5-10 years after treatment initiation). The theoretical basis for comparison is driven by other chronic illnesses research focusing on quality of life as an important outcome.

Another study compares subgroups according to different patterns of non-opioid substance misuse, based on the premise that OUD treatments are complicated by misuse of other substances.

One last study compares 2 subgroups according to opioid dependence severity, based on the premise that different severity profiles may present different clinical characteristics.

*Variables, measures, and definitions.* Most variables, measures, definitions, and study designs vary between studies, thus making meta-analysis impractical.

In terms of sociodemographic variables, all 9 retained studies report age and sex/gender of participants, but some use a continuous variable for age while others use a categorical variable. Six studies report information on ethnicity, but use different categories (eg, some distinguish between whites and others; some distinguish between white, aboriginal and others; some distinguish between whites, African Americans and Latinos, and so on). Three studies describe housing stability or homelessness but the concept is operationalized (as permanent housing in the past 30 days) in only one of them. Employment is reported in 7 studies, most often as a dichotomous (yes/no) variable or as a more detailed categorical variable in 2 instances. Marital status is reported in 4 studies, as a dichotomous (yes/no) variable in 3 instances, and as a categorical (married, divorced/separated/widowed, never married) in 1 case. Five studies report on education, but 2 use a continuous variable (number of years), 1 uses a dichotomous (yes/no) variable, and 2 use a categorical variable (highest degree obtained). Out of 3 studies reporting on crime variables, 2 use dichotomous (yes/no) variables for past year arrests, detention, convictions, or other judicial restraints and another uses a continuous variable (number of past-month crime).

Different mental health variables are reported in 7 studies. Nielsen et al<sup>42</sup> present mean scores for depression, anxiety and distress using the Kessler-10, mean scores for mental health disability using the Short Form-12, and a dichotomous (yes/no) variable for lifetime antidepressant prescription. Potter et al<sup>49</sup> report emotional well-being mean scores, measured with Short Form-36.<sup>50</sup> McCabe et al<sup>43</sup> report psychiatric treatment in the last 30 days. Mital et al<sup>51</sup> report psychological distress in the past year measured with the K6 screener<sup>52</sup> and major depressive episode in the past year measured with the Composite International Diagnostic Interview.<sup>52</sup> De Maeyer et al<sup>53</sup> present overall psychopathology as a dichotomous (yes/no) variable measured with the BSI<sup>54</sup> and medication for psychological problems during the last year as a dichotomous (yes/no) variable. Shand et al<sup>55</sup> report dichotomous variables for depression, post-traumatic stress disorder, panic disorder, anti-social personality disorder and borderline personality disorder diagnosed with the Semi-Structured Assessment of the Genetics of Alcoholism—Australia.<sup>56,57</sup>

**Table 1.** Studies comparing different profiles of people presenting problematic opioid use.

AUTHORS, COUNTRY	SAMPLE	DESIGN, MEASURES, AND ANALYSIS FOR PROFILE COMPARISON	TYPOLOGY/SUB-GROUPS/CLASSIFICATION	KEY FINDINGS IN BIVARIATE ANALYSIS
Fischer et al <sup>58</sup> Canada	n = 484 out of treatment people who use opioid and other illicit substances from the Opican cohort (Canada)	<i>Design:</i> cross-sectional—interviews <i>Measures:</i> self-reported  Sociodemographic variables: age (continuous), sex (male vs female), ethnicity (white, aboriginal, or other), housing status and income from paid work  Criminal justice variables: arrest, detention, judicial restraint  Drug use variables: cocaine, crack, benzodiazepine, opioids in combination with non-opioids use; injection, injection equipment sharing, overdose, prevalence of heroin use, and PO use  Health, health care, and social services-related variables: physical health problem, currently receiving health care, use of a walk-in clinic, use of an emergency room, use of a private physician, use of welfare services, and use of a drop in shelter	Three subgroups compared according to type of opioid used. Based on previous evidence that people who use pharmaceutical-type opioids may feature less severe characteristics.	Heroin only (n = 94): more likely to be younger, more likely to belong to first nations, less likely to use benzodiazepines, less likely to have physical health problems, less likely to use health and social services  Prescription opioid (n = 304): more likely to be white, more likely to have residential stability, more likely to have work income, less likely to use injection modes of administration  Both heroin and prescription opioids (n = 86): more likely to use cocaine, more likely to experience overdoses (past 6 months)
Nielsen et al <sup>42</sup> Australia	n = 192 OAT recent entrants in Australia	<i>Design:</i> cross-sectional—structured interviews  <i>Measures:</i> Demographics: Gender, age, employment, unstable housing and education level. Substance use and treatment history: Recent and lifetime drug use, routes of administration, source of pharmaceuticals, overdose history, problematic alcohol use (Alcohol Use Disorders Identification Test)  Primarily pharmaceutical opioid analgesic (n = 75): less likely to use injection, less likely to use methamphetamines, more likely to have started use with a prescription, more likely to take antidepressants	Two sub-populations compared according to the main type of opioid used. Based on previous evidence that there may be significant differences between populations who use illicit opioids such as heroin and populations who use prescription opioid analgesics.  Self-perceived physical and mental health: (Kessler-10, Short Form-12), health service Utilization Crime (Opiate Treatment Index Crime scale)	Primarily heroin (n = 117): more likely to have overdoses history, more likely to be involved in crime  Three-class model from latent class analysis: a large group with traditional characteristics associated with illicit heroin use, a second group with similar characteristics but higher risk, a third group more likely to have developed an OUD through a prescription for pain.

(Continued)

Table 1. (Continued)

AUTHORS, COUNTRY	SAMPLE	DESIGN, MEASURES, AND ANALYSIS FOR PROFILE COMPARISON	TYPOLOGY/SUB-GROUPS/CLASSIFICATION	KEY FINDINGS IN BIVARIATE ANALYSIS
Potter et al <sup>49</sup> USA	n = 1269 patients from an OAT program at baseline in the USA	<i>Design:</i> cross-sectional—data from a multisite safety trial  <i>Measures:</i> demographic: age, gender, race, ethnicity	Three subgroups compared according to type of opioid used. Based on previous evidence of differences in clinical characteristics of individual by type of opioid used.	Heroin only (n = 693): less likely to be white, less likely to use sedatives, higher scores on pain scale, higher scores on emotional well-being  Opioid analgesic only (n = 170): more likely to be younger, less likely to use cocaine, less likely to use injection  Combined heroin and opioid analgesics (n = 387): lower scores on pain scale  People who inject opioids (n = 873): more likely to be male, more likely to be older, more likely to be Hispanic, more likely to be cocaine dependent, more likely to have ever used heroin, more likely to report fewer days of OA use and more days of heroin use
McCabe et al <sup>43</sup> USA	n = 1648 individuals with OUD admitted in treatment programs in Florida (access to recovery)	<i>Design:</i> cross-sectional—data were collected through clinical reviews as part of a program evaluation  <i>Measures:</i> (extracted from ASI and GPRA at intake)  Sociodemographic: Age, education, gender, ethnicity, employment, marital status, children, lives with a person who uses opioids, homelessness.  Opioid use: type and number of days. Psychiatric treatment Chronic medical problems	Two subgroups compared according to the presence or absence of injection. Based on previous evidence of differences in clinical characteristics of individual depending on route of use.  Three sub-groups compared according to type of opioid used. Based on previous evidence that people who use prescription opioids may feature different characteristics (such as higher levels of education and income), hence better treatment outcomes. *The term "prescription opioid" refers to the type of opioid, which may not have been obtained through a prescription.	Heroin only (n = 161): more likely to be men, more likely to belong to a minority, more likely to be homeless  Prescription only (n = 1104): more likely to receive treatment for a psychiatric condition, more likely to present chronic medical problems  Both heroin and prescription opioid (n = 383): more likely to be younger

(Continued)

Table 1. (Continued)

AUTHORS, COUNTRY	SAMPLE	DESIGN, MEASURES, AND ANALYSIS FOR PROFILE COMPARISON	TYPOLOGY/SUB-GROUPS/CLASSIFICATION	KEY FINDINGS IN BIVARIATE ANALYSIS
Mital et al <sup>51</sup> USA	n=4496 people presenting problematic opioid use from the 2003 to 2014 National Surveys on Drug Use and Health in the USA	<i>Design:</i> cross-sectional—National Survey  <i>Measures:</i> opioid use: type within 12 months  <i>Demographic:</i> sex (male, female), age (categorical), ethnicity (non-Hispanic White, non-Hispanic Black, non-Hispanic other, Hispanic), rurality (urban and non-urban), education (categorical), employment status, marital status, and health insurance coverage. Substance use: tobacco, alcohol, other illicit substances (DSM-V criteria).  <i>Mental health:</i> Psychological distress (K6 screener) and major depressive episode (DSM-V)	Three subgroups compared according to type of opioid used. Based on previous evidence that non-medical prescription opioid may be a gateway to heroin use, followed by co-use, exposing individuals to greater risks. *Non-medical prescription opioid use is defined as use of prescription opioids without a prescription or use to obtain a feeling.	Heroin only (n = 133): more likely to be outside the labor force  Non-medical prescription opioid only (n=4076): more likely to be woman, more likely to live in non-urban areas, more likely to be college graduates, more likely to work full-time, more likely to be married, more likely to have insurance coverage, less likely to use tobacco, less likely to abuse illicit drugs  Non-medical prescription opioid and heroin co-use (n=287): more likely to be younger, more likely to be men, more likely to be white, more likely to have less than a high-school degree, more likely to be unemployed, more likely to have psychological distress, more likely to use illicit drugs
Tkacz et al <sup>50</sup> USA	n = 768 OUD patients admitted in a buprenorphine program in the USA	<i>Design:</i> cross sectional data from an observational study at baseline  <i>Measures:</i> demographic: age, education, gender, race, marital status, insurance coverage type, and socioeconomic states  <i>Addiction severity index:</i> drug, alcohol, legal, employment, family/social, psychiatric, and medical	Three subgroups compared according to type of opioid used. Based on previous evidence that opioid use groups will present different patient profiles at treatment induction.	Street use (n = 127): more likely to be men, lower medical problem severity  Prescription use (n = 444): more likely to have more years of educations, more likely to be white, more likely to be married, more likely to have commercial insurance, more likely to be employed, lower employment problem severity, lower legal problem severity  Combination use (n = 197): more likely to be younger, higher drug problem severity, higher family problem severity
De Maeyer et al <sup>55</sup> Belgium	n = 159 OUD patients from a methadone treatment program in Belgium	<i>Design:</i> cross-sectional—structured interviews  <i>Measures:</i> quality of Life Profile (LQoLP)—including demographic (age, gender, intimate relationship, having at least one good friend, structured form of daily activities, social benefit), and crime  <i>EuropASI:</i> heroin use, cocaine use, cannabis use, alcohol use, injecting behavior, methadone use, current juridical situation, chronic medical complaints, physical complaints in the last 30 days, medication for psychological problems  <i>Psychiatric distress:</i> brief symptom inventory, satisfaction scale for methadone treatment	Three subgroups compared according to classes of quality of life as an outcome of methadone treatment (5-10 years after treatment initiation). Based on other chronic illness research paying attention to quality of life as an important outcome. In order to evaluate if quality of life patterns are related to other patient variables.	Low quality of life class (n = 23): more likely to be convicted of a crime in the last year  <i>Intermediate quality of life scores</i> (n=41)  High quality of life class (n = 95): more likely to be employed, lower mean scores for psychopathologies, less likely to use injection modes of administration, less years of regular heroin use, less likely to be on methadone currently

(Continued)

Table 1. (Continued)

AUTHORS; COUNTRY	SAMPLE	DESIGN, MEASURES, AND ANALYSIS FOR PROFILE COMPARISON	TYPOLOGY/SUB-GROUPS/ CLASSIFICATION	KEY FINDINGS IN BIVARIATE ANALYSIS
Fong et al <sup>34</sup> USA	n = 19 101 OUD patients in 85 OAT programs in the USA	<i>Design:</i> cross-sectional—pencil and paper survey  <i>Measures:</i> demographics: age, ethnicity, sex, urbanity, employment  <i>Drugs:</i> opioids (buprenorphine, fentanyl, hydrocodone, hydromorphone, methadone, tapentadol, tramadol, morphine, oxycodone, oxymorphone and heroin, and checklist of non-opioid drugs used in the past month (tobacco, heavy alcohol use, marijuana, MDMA, cocaine or crack, crystal meth, hallucinogens, anti-anxiety medications, prescription sleep medications, muscle relaxants, and anti-depressants). Pain related questions (moderate to very severe + persisted for 6 or more months).	Four subgroups compared according to different patterns of non-opioid substance misuse. Based on the premise that opioid use disorder treatments are complicated by misuse of other substances.	<i>Low use of other substances</i> (n = 14 009)  <i>Non-opioid Rx use</i> (n = 2970): highest percentage of woman, higher prevalence of chronic pain and legitimate medical sources for opioid, lowest percentage unemployed, lowest percentage of urban dwellers  <i>Marijuana-Cocaine use</i> (n = 1760)  <i>Poly-drug use</i> (n = 462)
Shand et al <sup>55</sup> Australia	n = 1511 OUD patients in OAT in the Sydney area	<i>Design:</i> cross-sectional—structured interviews  <i>Measures:</i> Demographic: age, sex, employment, marital status, education measure of opioid use  <i>Suicide attempts substance use and dependence diagnosis (SSAGA-OZ + DSM):</i> alcohol, cannabis, sedative and stimulants, and cocaine abuse and dependence, nicotine dependence  <i>Mental health (DSM + IPDE):</i> posttraumatic stress disorder, major depressive episode, panic disorder and antisocial personality disorder Childhood trauma, adult victimization, family history (Christchurch Health and Development Study interview, FHAM, FHS, SSAGA-OZ)	Two subgroups compared according to opioid dependence severity. Based on latent class analysis and the premise that different severity profiles (DSM-IV) may present different clinical characteristics.	<i>Severe dependence class</i> (n = 1120): increased risk for sedative and cocaine dependence, increased risk for multiple opioid overdoses, increased risk for antisocial personality disorder  <i>Moderate dependence class</i> (n = 390)

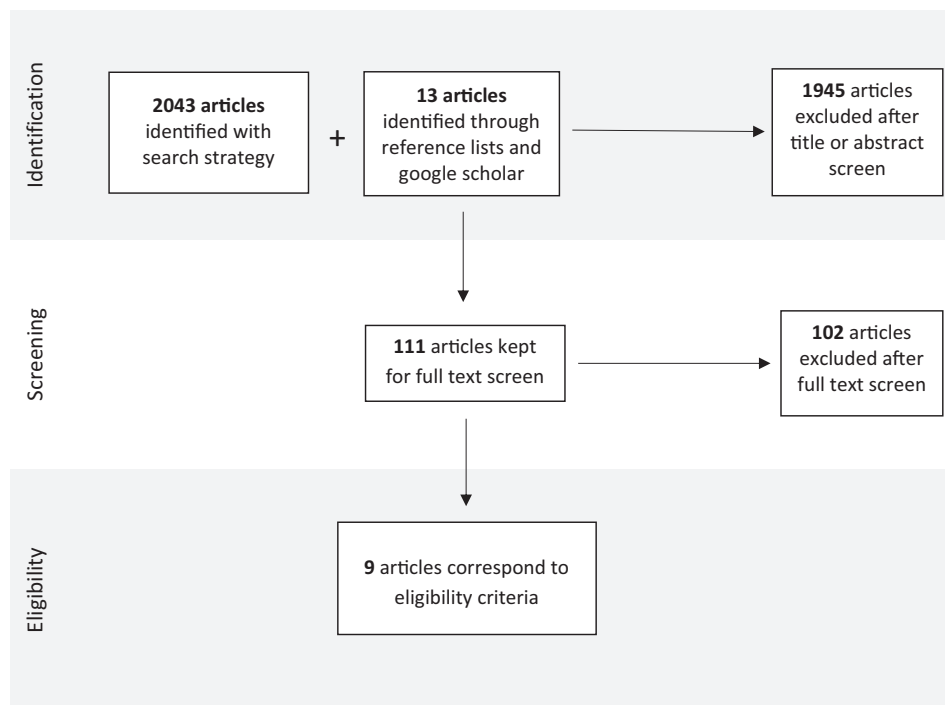


Figure 1. Flow chart.

Most studies discriminate profiles by types of opioid used. Five studies distinguish between heroin, non-heroin opioids, and both. Two studies distinguish between misuse of prescribed opioid medication, use of illegal opioid substances, and both. One study uses a dichotomous independent variable (primarily heroin vs primarily medication). For the purpose of the present article, the term “pharmaceutical-type opioids” will be used to describe non-heroin opioids.

Overall, the majority of studies compare profiles of people presenting problematic opioid use according to age, sex, education, other substances used, ethnicity, employment, mental health variables, and types of opioid used. Other characteristics like criminal activities, homelessness, or chronic pain are described in less than half the studies.

### Findings

In broad terms, 5 classifications emerge from the literature reviewed to distinguish types of people presenting problematic opioid use or OUD, according to: (1) the type of opioids used, (2) the route of opioid administration, (3) the level of quality of life, (4) patterns of other drugs used, and (5) dependence severity (see Table 1).

*Classification 1: According to type of opioids used.* Depending on the studies, classifications based on type of opioids used distinguish between heroin, pharmaceutical-type opioids, and both.

*People who use heroin.* According to the results derived from different studies and samples, subjects using heroin only may be more likely to belong to first nations<sup>58</sup> or a minority,<sup>43</sup> to be younger,<sup>58</sup> to be men,<sup>43</sup> to be homeless,<sup>43</sup> and to be outside

the labor force,<sup>47</sup> compared with subjects using pharmaceutical-type opioids. Subjects using primarily heroin may be more likely to be involved in crime, compared with those using primarily pharmaceutical-type opioids.<sup>42</sup> Potter et al<sup>49</sup> report higher emotional well-being for subjects who use heroin only, compared with those who use either pharmaceutical-type opioids only or both pharmaceutical-type opioids and heroin. In terms of physical health, Fisher et al<sup>58</sup> report that people who use heroin are less likely to have physical health problems and to use health and social services compared to those who use pharmaceutical-type opioids in a Canadian cohort study. Conversely, Potter et al<sup>49</sup> report higher scores on a bodily pain scale for people who use heroin in a sample of OAT patients in the USA. In terms of substance use, people who use heroin appear less likely to use benzodiazepines<sup>58</sup> or sedatives.<sup>49</sup> According to Nielsen et al<sup>42</sup> subjects who use primarily heroin are more likely to report lifetime overdoses.

*People who use pharmaceutical-type opioid.* Compared with subjects using heroin, some studies suggest that people presenting problematic use of pharmaceutical-type opioids may be more likely to be or have been married,<sup>51,59</sup> to be women<sup>51</sup> and to be younger.<sup>49</sup> Three North American studies indicate that they may be more likely to have work income<sup>58</sup> and to be employed.<sup>51,59</sup> Additionally, 2 American studies suggest that people presenting problematic use of pharmaceutical-type opioids are more likely than those who use heroin to be college graduates or to have more years of education.<sup>51,59</sup> In 3 North American samples of people presenting problematic opioid use (in or out of treatment), those who use only pharmaceutical-type opioids are more likely to be white<sup>49,58,59</sup> compared with those who use heroin. Conversely, in a sample from national



surveys, people presenting problematic use of pharmaceutical-type opioids may be more likely to be Hispanic.<sup>51</sup> They may also be more likely to live in non-urban areas<sup>51</sup> and to have residential stability.<sup>58</sup> Two distinct studies report that subjects who use primarily or only pharmaceutical-type opioids are more likely to have antidepressants prescribed<sup>42</sup> and to receive treatment for a psychiatric condition.<sup>43</sup> McCabe et al<sup>43</sup> report that people presenting problematic use of pharmaceutical-type opioids are more likely to have chronic medical problems. Many authors report that they are less likely to use other substances, for instance tobacco,<sup>51</sup> cocaine,<sup>49</sup> methamphetamine,<sup>42</sup> and any other illegal drugs.<sup>51</sup> They also appear less likely to use injection modes of administration.<sup>49,58</sup> Nielsen et al<sup>42</sup> add that subjects who use primarily pharmaceutical-type opioids are also less likely to use injection modes of administration and appear more likely to have started use with a prescription.

*People who use both heroin and pharmaceutical-type opioids.* In American samples, subjects who use both heroin and pharmaceutical-type opioids are more likely to be younger<sup>42,51,59</sup> and to be men,<sup>51</sup> compared to those who use only one type of opioids. A National Survey study shows psychological distress being more likely for subjects who use both heroin and pharmaceutical-type opioids compared to subjects who use only one type of opioids.<sup>51</sup> Additionally, those who use both heroin and pharmaceutical-type opioids appear more likely to use other illegal drugs,<sup>51</sup> such as cocaine<sup>58</sup> and sedatives,<sup>49</sup> as well as to report overdoses in the past 6 months compared to those who use only one type of opioids.<sup>58</sup>

*Classification 2: According to route of administration.* Potter et al<sup>49</sup> also compared OUD profiles based on modes of administration in an OAT sample in the United States. They distinguish profiles between those who inject opioids and those who use other routes of administration. They report that subjects who inject drugs are more likely to be older, to be men and to be Hispanic, compared to subjects who do not inject. They also report that those who inject drugs are more likely to be cocaine dependant, to use or have used heroin.

*Classification 3: According to the level of quality of life.* A Belgian study comparing patients with OUD based on 3 profiles of quality of life (low, intermediate, and high) reports that subjects with high quality of life are more likely to be employed and less likely to be involved in crime compared to those with low or intermediate profiles of quality of life. Those with a high quality of life profile also have lower mean scores for psychopathologies and are less likely to use injection modes of administration.<sup>53</sup>

*Classification 4: According to patterns of other drugs used.* In a very large sample of American patients in OAT, subjects are compared according to 4 patterns of other drugs used (low use of other substances profile, non-opioid medication use profile, marijuana-cocaine use profile, and polydrug use profile). Those with a non-opioid medication use profile (ie, higher odds using

muscle relaxant as well as depression, anxiety, or sleep medication) stand out from other profiles in terms of lower percentage of urban residents, lower unemployment, higher percentage of women, and higher prevalence of chronic pain compared to other profiles.<sup>34</sup>

*Classification 5: According to dependence severity.* In one other sample of patients in OAT, subjects are compared according to 2 dependence severity profiles (severe and moderate). Higher rates of antisocial personality disorder were found in those with high substance use severity profile. Additionally, those with a high substance use severity profile are found at increased risk to report overdoses as well as cocaine and sedative use disorders.<sup>55</sup>

## Discussion

Data was extracted from articles on profiles of people presenting problematic opioid use, in order to support the targeting of specific service needs and the development of tailored interventions. Results highlight 3 main areas of conclusions: (1) methodologies (heterogeneous samples, concepts and measures); (2) results (convergent and divergent conclusions); (3) implications for research and practice (relevance of local assessments of profiles and needs).

### *Heterogeneous samples, concepts, and measurement tools*

This scoping review does not allow drawing solid conclusions on different profiles of people presenting problematic opioid use because of varying samples, conceptual definitions, measurement tools and results. In line with this statement, the review supports the need for standardized conceptual definitions and measures as well as building on previous published work for defining concepts and choosing measurement tools.

In terms of samples, the studies were based on 3 possibly different populations. While most samples were drawn from OAT programs, one was from a cohort of people who actively use substances and one was from a nationally representative survey.

With regards to conceptual definitions, descriptions of the types of opioid used is especially problematic. While it is clear that heroin is always obtained and used illegally, other types of opioids are sometimes referred to as pharmaceutical opioids or prescription opioids, which is misleading since they can be counterfeit or diverted and thus obtained without a prescription. Some authors distinguish between street use and prescription use, which holds the advantage of being clear but fails to address the different types of street use. Thus, the current paper puts forward the term “pharmaceutical-type opioids” to describe any legally or illegally produced or obtained non-heroin opioid.

When it comes to measurement tools, the reviewed studies were particularly heterogeneous in terms of mental health measures, which renders the identification of specific needs in this area quite impractical.

### *Existence of different profiles of people presenting problematic opioid use*

Although the review of the literature does not allow drawing solid conclusions on the characteristics associated with different opioid profiles because of varying samples, concepts and measurement tools, it does confirm the existence of different profiles of people presenting problematic opioid use, and possible different treatment needs.

The reviewed studies, which contrast people who use opioids based on modes of administration, quality of life, patterns of non-opioid substance misuse and opioid dependence severity provide some interesting significant differences between profiles, but seem to remain insufficient to base a classification to support the targeting of specific service needs and the development of tailored interventions. However, the studies contrasting individuals based on type of opioids used provide stronger evidence of significantly different profiles. The most salient finding might be the distinct profile of subjects who have a problematic use of pharmaceutical-type opioids. Some convergent results suggest that this profile shows higher proportions of subjects who are married, employed, educated, and Caucasian. Results also suggest that subjects with this profile are more likely to suffer from mental health issues and are less likely to inject or use many substances, compared to other profiles. Importantly, it must be noted that some results contradict these findings in terms of education, employment, and ethnicity. This could be explained in part by the different samples (patients in OAT vs subjects identified in national surveys vs people who actively use illegal substances in a cohort study). It could also be explained by geographic differences. For instance, a qualitative Australian study on young people presenting problematic opioid use of pharmaceutical-type opioids highlights 2 distinct profiles. The first was recruited from privileged suburbs, had higher education, stable housing, higher income, and parental support, and was characterized by oral use. The second was recruited from socioeconomically disadvantaged suburbs, had lower education, less employment opportunities, unstable housing and was characterized by injection use.<sup>60</sup> The same authors also cite important distinctions between countries in opioid prescribing and public health response to pharmaceutical opioid diversion, which in the case of the United States, might have encouraged transition to heroin by restricting availability of pharmaceutical opioids.<sup>41</sup> Additionally, geographical differences in drug markets might play a role in explaining divergences in profiles. For example, between 2000 and 2008, the price-quality ratio for heroin was better in Philadelphia than in San Francisco, where buying pills had a better price-quality ratio.<sup>61</sup> Finally, what many authors refer to as the “opioid crisis” has been evolving dynamically over the years, which might also play a role in explaining divergences, since the present review includes studies going back to 2008. At the time, the increasing use of

opioids was already well documented. In fact, in 2008, non-medical use of prescription-type opioids was the fourth most common substance used, just after alcohol, tobacco, and cannabis.<sup>62</sup> Nonetheless, over the years, contextual elements such as strategies to control the opioid crisis and emergence of highly potent opioids on the illegal market might have influenced shifts in profiles. Even more recently, the COVID-19 pandemic has contributed to the transformation of the illegal drug market and to the reduced access to addiction services, demonstrating the ever-changing nature of the context and the importance of local and timely monitoring.

Finally, the majority of the reviewed studies test hypotheses on distinctive characteristics of individuals according to the type of opioids they use, their level of quality of life, their patterns of other drug use, and their dependence severity. Considering the modest amount of current evidence on which to base hypotheses, exploratory processes, such as the one used by Nielsen et al<sup>42</sup> with latent class analysis might reveal underlying patterns of characteristics that could provide further insight on profiles and associated service needs. Moreover, qualitative work is pivotal to understand service needs for different profiles. In fact, one study by Stumbo et al<sup>63</sup> begins to address this lack of knowledge by reporting that some patients with concurrent OUD and chronic pain are afraid that their pain will not be adequately managed and that they will be stigmatized if they receive treatments in facilities designed for people with heroin dependence.

### *Relevance of local timely assessments of profiles and needs for service administration*

The above-mentioned geographical and chronological differences in the profiles of people presenting problematic opioid use suggest that timely local assessments of profiles should support the development of service organization and tailored interventions for people with OUD.

To illustrate this point, Heimer et al<sup>64</sup> highlight the lack of awareness about HIV, hepatitis, drug overdoses, and viral infection status in a suburban area, underlining the need for harm reduction services targeting suburbanites who inject drugs. In another example, Cleland et al<sup>65</sup> suggest that where people who use pharmaceutical-type opioid are younger, vocational training should be offered while chronic disease management should be enhanced for older adults who use heroin.

Many authors call for retailoring prevention and treatment services to new emerging profiles.<sup>42-44,66,67</sup> In addition, some authors insist on the importance of understanding factors that contribute to regional differences in opioid use, such as culture, practices and regulations.<sup>7,68</sup> In line with their work, this review supports a better understanding of how local factors like socioeconomic contexts, local illegal drug markets and public health policies shape different profiles of people who have problematic opioid use and their associated needs.

This understanding may be key to adapting the service offer to specific needs.

### Limitations and Conclusion

This review's limitations involve 2 main aspects, inherent to the small number of included studies and the studies' heterogeneity in terms of concepts and measurement tools. Only a small number of studies met the inclusion criteria and the included studies used different concepts and measurement tools, rendering comparison impractical, and pooling impossible.

While this scoping review highlights that few studies address distinctive profiles of people presenting problematic opioid use, it also underlines that those that do compare profiles provide interesting avenues to reach a better understanding of different individual characteristics and thus, potential distinct treatment and service needs. For instance, some results suggest that patients who have a problematic use of pharmaceutical-type opioids show a distinct socioeconomic profile, with higher risk of suffering from mental health issues, suggesting the need for tailored screening and treatment strategies. However, geographical, chronological, and contextual differences call for local timely assessments to tailor the service offer to specific needs.

Future studies should focus on strengthening the body of evidence in this regard by building on previously published research. Additionally, complementary research designs might reveal underlying patterns of characteristics that could provide further insight on new individual profiles and associated service needs. More specifically, in order to develop clinically relevant results, exploratory quantitative designs to identify profiles should be followed by qualitative and participatory research to provide a deep understanding of distinct experiential perspectives on service's needs.

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### Author Contributions

LA, KB, and MP identified the review's objectives and designed the methodology. LA conducted the literature review and wrote the manuscript, which was corrected and supplemented by KB and MP.

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