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IMPLEMENTING INJECTABLE OPIOID AGONIST TREATMENT: A SURVEY OF PROFESSIONALS IN THE FIELD OF OPIOID USE DISORDERS

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ABSTRACT

Background: Engagement of health care professionals represents an important factor for successful implementation of new practices. To support these professionals' involvement, it is essential to understand their perspective. This study describes the perspective of professionals in the field of opioid use disorder (OUD), in the province of Quebec (Canada), regarding appropriateness of iOAT for their patients and the obstacles to its implementation.

Methods: A web-based survey was conducted, with 132 OUD professionals (physicians, pharmacists, nurses and counselors).

Results: 80.3% of respondents report prior knowledge of iOAT, 87.6% are interested in obtaining additional information on iOAT, and 98.1% consider iOAT to be very or partially appropriate for their clientele. In terms of barriers to iOAT implementation, the main obstacles highlighted by respondents pertain to the lack of available or qualified staff, access to appropriate facilities and equipment, and patient transportation. Professionals who perceive iOAT to be very appropriate for their clientele are more likely to report a higher number of patients with biopsychosocial deterioration, to consider themselves to be very familiar with iOAT, and to work in a higher population density area.

Conclusions: Results highlight feasibility challenges, but support perceived appropriateness of iOAT in a sample of OUD professionals in Quebec.

Keywords: Injectable opioid agonist treatment; opioid use disorders; professionals; feasibility; acceptability

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Introduction

People who inject drugs constitute a highly vulnerable group, namely in terms of physical health and social integration (Gouvernement du Québec [MSSS], 2018). In addition to being at risk for blood-borne and sexually transmitted infections, people who inject drugs may suffer from overdoses, abscesses, tuberculosis, cardiovascular problems and mental health issues (Brisson, 2011). These problems can also be aggravated by relational difficulties such as social isolation or unemployment (Brisson, 2011).

More specifically, people with an opioid use disorder (OUD) who use injection modes of administration show higher severity profiles compared to those who do not inject. In fact, they have higher odds of being less educated (Cushman et al., 2016), to report long term substance use, to be unemployed, to have unstable housing (Crooks et al., 2015; Cushman et al., 2016), to present an increased likelihood for arrests or incarcerations (Cushman et al., 2016), to have a posttraumatic stress disorder (Mills et al., 2007) or other mental health issues, and to present sexual and drug use practices that put them at risk (Crooks et al., 2015). Between 22% and 24% of people who inject opioids report having had an overdose in the last year (Cedarbaum & Banta-Green, 2016; Tsui et al., 2018).

Treatment of OUD with opioid agonist medications have demonstrated substantial effectiveness in terms of relieving symptoms, reducing opioid use, retaining OUD patients in treatment (Connery, 2015), as well as reducing criminality and mortality rates (Canadian Research Initiative on Substance Misuse [CRISM], 2018). However, an important subset of people who inject opioids and present a severe OUD do not benefit from conventional oral OAT. In fact, a recent review shows that retention rate in OAT is estimated around 57% at 12 months and 38% at three years (O'Connor et al., 2020). While negative experiences in OAT may result from persistent side effects, cravings, or inability to reach a therapeutic dose (British Columbia Ministry of Health, 2017), factors such as age, gender, ethnicity, legal problems and social functioning may also be associated with OAT dropout (O'Connor et al., 2020).

For people with severe OUD and complex problems who are not responding to conventional oral opioid agonist treatments (OAT), injectable opioid agonist treatment (iOAT) with diacetylmorphine (i.e. pharmaceutical heroin) or hydromorphone is another evidence-based treatment option. More specifically, the national iOAT guideline (CRISM, 2019) recommends the integration of iOAT as part of a continuum of care model, allowing for intensification and de-intensification of treatment options to match individual needs as they evolve.

To date, seven clinical trials have been conducted using diacetylmorphine in a number of European countries and in Canada (Bell et al., 2018; Strang et al., 2015). Results show effectiveness of iOAT on illicit opioid use reduction and treatment retention for people who are not responding to standard treatment (Ferri et al., 2011; Strang et al., 2015). An eighth trial demonstrated that hydromorphone was not inferior to diacetylmorphine (Oviedo-Joekes et al., 2016). Retention rates in iOAT are reportedly high (Strang et al., 2015), and around half of participants respond well to treatment based on various indicators, such as reduced street heroin, decreased criminality, and

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improved health (Bell et al., 2018). At least two trials also demonstrated the value of iOAT when combined with comprehensive psychological, social and legal support for improving health status and social functioning (March et al., 2006; Perneger et al., 1998). At the time of writing this article, iOAT was available in a few Western European countries, as well as in three Canadian provinces (British-Colombia, Alberta and Ontario) and the province of Quebec was in the process of expanding its OAT offer to include iOAT.

Injectable opioid agonist treatment (iOAT) can be described as an intensive (Bell et al., 2018; Strang et al., 2015) or resource-intensive (Eydt et al., 2021) treatment. It typically involves two or three (up to seven) daily attendances for supervised injections of prescribed medication (Bell et al., 2018; Eydt et al., 2021). Canadian environmental scans highlight four service delivery models for iOAT: comprehensive and dedicated (i.e. encompassing care exclusively for iOAT patients), embedded and integrated (i.e. incorporating iOAT within existing services), pharmacy based (i.e. pharmacy maintenance after induction in a health center), and hospital based (i.e. iOAT provision during hospitalization) (Eydt et al., 2021). Additionally, in the context of the COVID-19 pandemic, a case study was published to demonstrate the feasibility of injectable diacetylmorphine take-home doses, illustrating possible individualized modalities (Oviedo-Joekes et al., 2021). Conceptually, iOAT has been framed either as a stepping stone towards traditional oral OAT, or as a longer-term harm-reduction intervention (Bell et al., 2018).

When it comes to implementing a harm reduction program, favorable conditions have been identified at different levels (policy, community, organization, provider and service user). In fact, Smith et al. (2019 AQ3) suggest that the consultation, involvement and consensus of stakeholders at all levels is a key factor for successful implementation. Other documented facilitators include responsive political environments inclined to support innovation and address socio-structural factors (Strike & Watson, 2019 AQ4), flexible bottom-up approaches, as well as clinical implementers' willingness or beliefs about the feasibility of the intervention (Resiak et al., 2021 AQ5). Consequently, in order to inform the implementation of such programs, it is highly important to document the perspective of service providers.

In this context, health care and community workers involved with people presenting an OUD are central stakeholders. However, only one prior study was found to document their perspective on iOAT implementation. This American study, published in 2018, collected focus group data with 80 professionals from associated fields (i.e. criminal justice, harm reduction, medical, policy and treatment). Results mostly show concerns about iOAT enabling drug use and being infeasible as well as a desire to see more evidence on effectiveness (Ober et al., 2018). Another study focusing on the perspective of nurses involved in iOAT programs highlights that staff may be concerned with overdose and diversion risks (Demaret et al., 2012).

The main objective of the present article is to describe the perspective of OUD professionals in the province of Quebec regarding appropriateness of iOAT for their patients and the obstacles to its implementation. The secondary objective is to explore factors that may influence these perspectives. Results should inform decision makers, managers and researchers on factors that may foster or impede iOAT implementation, at the healthcare provider level.

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Materials & methods

A web-based survey was conducted to describe the perspective of OUD professionals on iOAT implementation in the province of Quebec, Canada.

The study was conducted using a convenience sample. An email invitation to participate in the survey was distributed to OUD counselors, physicians, pharmacists and nurses using snowball sampling, with the help of three professional associations (pharmacists, social workers and nurses). The email invitation was also circulated with the help of a substance use disorders (SUD) medicine community of practice, associations for SUD counselors, SUD centers, and peer-helpers, and the study's advisory committee, which is comprised of key stakeholders in the SUD treatment community (such as health ministry representatives).

The invitation included the topic of the study (iOAT implementation in Quebec), the eligibility requirements (being a counselor, physician, pharmacist or nurse involved with people having an opioid use disorder in Quebec), and a link to the questionnaire hosted on a licensed LimeSurvey online survey tool.

Data collection took place between 6 August and 20 September 2019. The questionnaire included a summary of the study protocol, an information and consent form, as well as a fact sheet on iOAT. The fact sheet included information on treatment modalities (i.e. a structured second line treatment, involving up to three daily visits for supervised self-injection), evidence-based outcomes (in terms of retention, illicit opioid use reduction and reduction in criminal activities), and target population (i.e. patients who are not responding to traditional oral OAT). Professional practice and demographic information were documented (i.e. job title, workplace setting and geographic area). Then, the respondents' caseload in terms of higher vulnerability patients was documented with two questions regarding patients who continue to inject opioids after or while receiving OAT ('*How many do you consider to present an important deterioration of their physical, psychosocial or psychiatric condition?'* and '*How many do you consider to be at high overdose risk?'*). Also, participants were invited to rate their perceived level of prior knowledge on iOAT (*Have you ever heard of iOAT—how familiar are you with this treatment?*) and interest for more information ('*Would you be interested in obtaining more information regarding iOAT')*.

Additionally, a multiple choice question was developed by the research team to document the perspective of professionals on appropriateness of iOAT for their patients ('*How appropriate would iOAT be for your patients?'*). An open-ended question was used to ask respondents why they considered iOAT totally appropriate, partly appropriate or inappropriate for their clientele. Perceived obstacles were documented with the following open-ended question ('*In your work environment, what would be the main obstacles to iOAT implementation?'*). This open-ended question aimed to foster a better understand of the nature of barriers to iOAT implementation and evaluate the possibility to overcome them. Survey question are presented in Table 1. The questionnaire was pre-tested with ten OUD professionals.

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Table 1. Survey questions

1. Job title (doctor, pharmacist, nurse or counselor)
2. Workplace setting (specialized center for OAT, community organization, community pharmacy, hospital, local service center, clinic)
3. Geographic area (one of the 16 administrative regions of Quebec)
4. Regarding patients who continue to inject opioids after or while receiving OAT: How many do you consider to present an important deterioration of their physical, psychosocial or psychiatric condition.
5. Regarding patients who continue to inject opioids after or while receiving OAT: How many do you consider to be at high overdose risk?
6. How familiar are you with iOAT—IV diacetylmorphine or hydromorphone? (very familiar, somewhat familiar or not familiar at all)
7. Would you be interested in obtaining more information regarding iOAT?
8. How appropriate would iOAT be for your patients? (and why—open ended)
9. In your work environment, what would be the main obstacles to iOAT implementation? (open-ended)

Responses to multiple-choice questions were imported into SPSS. Bivariate comparisons were calculated using chi-square tests of independence to explore factors that influence perspectives on iOAT implementation. Cramer's V were also computed to interpret the strength of associations. Responses to the open-ended questions were examined using thematic analysis (Paillé & Mucchielli, 2012). For this purpose, qualitative data was synthesized into themes and recurrence of themes was computed (Paillé & Mucchielli, 2012). Themes were then classified in categories (Paillé & Mucchielli, 2012).

Ethical approval for this study was obtained by the Research Ethics Board of the CIUSSS Centre-Sud-de-l'Île-de-Montréal. Participation was anonymous, and data were coded and aggregated, to prevent for the identification of individual participants.

Results

Sample description

In total, 137 health care and community workers involved with people presenting an OUD participated in the survey. Almost half of the participants are counselors (48.2%), 25.5% are nurses, 13.9% are doctors and 12.4% are pharmacists.

In terms of workplace settings, specialized centers are the most represented (49.6%), followed by community organisations (28%), community pharmacies (13.6%), hospitals (12%), local service centers (9.6%), and clinics (4.8%). Some participants selected more than one workplace setting. Finally, 43.8% of participants work in an administrative region with more than 100 inhabitants per

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km^2, 41.6% work in an administrative region with between 6 and 100 inhabitants per km^2, and 14.6% of participants work in an administrative region with five or less inhabitants per km^2 (Table 2).

Table 2. Sample description (n = 137 health care and community workers involved with people having an opioid use disorder).

Profession (n = 137)	
Counselors	66 (48.2%)
Nurses	35 (25.5%)
Doctors	19 (13.9%)
Pharmacists	17 (12.4%)
Workplace settings[a] (n = 125)	
Specialized centers for OAT	62 (49.6%)
Community organizations	35 (28%)
Community pharmacies	17 (13.6%)
Hospitals	15 (12%)
Local service centers	12 (9.6%)
Clinic	6 (4.8%)
Administrative regions according to population density[b] (n = 137)	
More than 100 inhabitants per km2	60 (43.8%)
Between 6 and 100 inhabitants per km2	57 (41.6%)
Five or less inhabitants per km2	20 (14.6%)

[a]Some respondents identified more than one workplace setting.

[b]The province of Québec is comprised of 16 administrative regions. The most densely populated (more than 100 inhabitants per km^2) are Montreal, Laval and Monteregie. The least densely populated (five or less inhabitants per km^2) are Cote-Nord, Gaspesie-iles-de-la-Madeleine, Saguenay-lac-St-Jean, Abitibi-Temiscamingue and Baie-James. The other administrative regions count between 6 and 100 inhabitants per km^2.

Patients with biopsychosocial deterioration and overdose risk in participants caseloads

Regarding biopsychosocial deterioration and overdose risk in patients who pursue injection while or after receiving OAT, a total of 132 valid responses were compiled. Just over 65% of respondents estimate that they follow 10 or less patients with biopsychosocial deterioration and overdose risk. Just over 21% estimate that they follow between 11 and 50 patients with biopsychosocial deterioration and overdose risk. Almost 14% estimate that they follow more than 50 patients with biopsychosocial deterioration and overdose risk (Table 3).

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Table 3. Estimated number of patients who present an important biopsychosocial deterioration or overdose risk among those who continue to inject opioids after or while receiving OAT (*n* = 132).

10 and less	86 (65.2%)
Between 11 and 50	28 (21.2%)
More than 50	18 (13.6%)

Health care and community workers' self-reported knowledge and interest regarding iOAT

Among the respondents who participated in the survey, 23.4% reported being very familiar with iOAT, 56.9% reported being somewhat familiar with iOAT, and 19.7% reported having no knowledge of this treatment. In terms of their interest to learn more about this treatment, 87.6% of respondents reported having an interest in obtaining additional information on iOAT (Table 4).

Table 4. Respondents' self-perceived level of knowledge on iOAT and interest in learning more.

Level of knowledge on iOAT (*n* = 137)	
Very familiar	32 (23.4%)
Somewhat familiar	78 (56.9%)
No knowledge	27 (19.7%)
Interest in learning more (*n* = 136)	
Yes	120 (87.6%)
No	16 (11.7%)

Health care and community workers' perspective on the appropriateness of iOAT

A total of 107 participants evaluated iOAT's level of appropriateness for their patients. A small percentage of 1.9% declared that it would not be appropriate for their patients. More than a third of respondents (37.4%) considered it to be partially appropriate. The majority (60.7%) reported that it would be very appropriate (Table 5).

Table 5. Respondents perception on appropriateness of iOAT for their patients (*n* = 107).

Appropriateness of iOAT (*n* = 107)	
Very appropriate	65 (60.7%)
Partially appropriate	40 (37.4%)
Not appropriate	2 (1.9%)

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Exploration of factors that may influence perceived appropriateness of iOAT

Chi square analyses were computed on cases with no missing data ($n = 102$). Results show that participants who perceive iOAT to be very appropriate for their clientele are more likely to report more than 10 patients with biopsychosocial deterioration (X^2 (2, $N = 102$) = 8.765, $p < .05$; Cramer's $V = 0.293$), to consider themselves to be very familiar with iOAT (X^2 (1, $N = 102$) = 5.655, $p < .05$; Cramer's $V = 0.235$), and to work in a higher population density area (X^2 (2, $N = 102$) = 13.678, $p < .005$; Cramer's $V = 0.366$) . No associations were found between perceived appropriateness and profession, perceived overdose risk in patient caseload, wanting additional information on iOAT and workplace setting (Table 6).

Table 6. Factors associated with perceived appropriateness of iOAT ($n = 102$).

	Very appropriate	**Partially or not appropriate**	X^2 (*p*)	**Cramer's V**	**Valid *n***
Patients with deterioration			0.012	0.293	
10 and less	31 (49.2%)	32 (50.8%)			63
Between 11 and 50	20 (83.3%)	4 (16.7%)			24
More than 50	10 (66.7%)	5 (33.3%)			15
Prior knowledge on iOAT			0.017	0.235	
Somewhat familiar	39 (52.7%)	35 (47.3%)			74
Very familiar	22 (78.6%)	6 (17.9%)			28
Population density of region			0.001	0.366	
More than 100 per km2	36 (80%)	9 (20%)			45
Between 6 and 100 per km^2	20 (43.5%)	26 (56.5%)			46
Less than 6 per km^2	5 (45.5%)	6 (54.5%)			11

Additionally, 94 participants responded to the open-ended question regarding why they reported that iOAT would be partially or very appropriate for their patients. Accordingly, 10 main themes were identified, organized into five categories. Table 7 presents a summary of the results.

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Table 7. Analysis of respondents' comments on iOAT's perceived appropriateness for their clientele.

Categories and themes	**Number of participants (*n* = 94)**
1. Failure of other therapeutic options to attract and retain patients	
Standard oral treatment failure	33
Reaching and retaining patients	13
2. Addressing specific needs	
Meeting patients' needs	16
Importance of injection ritual for some patients	10
Physical, mental and social comorbidities	8
Chronic and severe opioid use disorders	4
3. Risk prevention	
Harm reduction	13
Preventing overdoses	11
4. An option for exceptional cases	
iOAT for a small proportion of patients	10
Standard oral treatment efficacy for the majority of patients	4
5. Other motives	
Ex. : empowerment, quality of life	14

A first category of themes emerged around the appropriateness of iOAT for patients who experiences failure of other therapeutic options. More specifically, thirty-three participants considered iOAT to be partially or very appropriate in the case of oral treatment failure, or for patients who were not responding to standard oral treatments. For instance, a pharmacist noted that '*methadone, suboxone and kadian are not addressing the patient's needs, in terms of efficacy and safety*'. Another 13 participants considered that iOAT could be partially or very appropriate to foster adherence and therapeutic alliance. These were grouped under the theme 'reaching and retaining patients'. One nurse in particular noted that it would be very appropriate for '*disorganized clientele who have difficulty adhering to conventional treatment*'. A doctor also mentioned that it could '*attract and retain people who are currently non-compliant or completely out of treatment*'.

A second category of themes emerged around addressing specific needs. Sixteen respondents (mostly those who reported that iOAT would be very appropriate), considered that patients' needs should be met. One counselor mentioned that, '*it is appropriate to offer different options adapted to the needs of people who use opioids*'. Ten participants raised the issue of the persistence of the injection ritual for people under OAT to justify the need for iOAT. For instance, a counselor noted that '*many people present not only an addiction to the substance, but also an addiction to the*

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injection ritual which often is an obstacle for treatment engagement'. Physical, mental and social comorbidities were cited by eight participants who considered that iOAT would be very appropriate for patients with many complex problems. A doctor wrote that iOAT would be very appropriate for '*clienteles with psychiatric comorbidities and social instability who have not responded to standard treatments*'. Finally, four participants considered iOAT to be very appropriate for severe and chronic OUD.

A third category of themes concerns risk prevention. Thirteen participants mentioned harm reduction as a reason to implement iOAT. One counselor reported working with people who often use unclean syringes and a nurse noted that iOAT would be safer, with no risk of fentanyl contamination. Eleven respondents considered iOAT to be very appropriate to prevent overdoses and death risks for their patients. One counselor wrote: '*my clients use many opioids non-stop and they could overdose and die*'.

A fourth category of themes revolves around the notion that iOAT should be used in exceptional cases only. A pharmacist mentioned that iOAT would be very appropriate for a '*very small proportion of patients: those who pursue injection actively, who are not ready to quit injection while being at high overdose risk*'. Similarly, ten respondents mentioned that iOAT would be appropriate for only a small number of patients. Four respondents highlighted the fact that iOAT would be only partially appropriate for their patients, because standard oral treatments are effective for the majority.

Finally, a fifth category includes isolated themes such as the importance of iOAT to foster empowerment and quality of life.

Health care and community workers' perspective on the barriers to iOAT implementation

A total of 100 participants identified barriers to iOAT implementation, and the analysis of the respondents' comments produced 11 themes. Table 8 presents a summary of themes and recurrence.

A first category of themes emerged around organisational barriers. Twenty-eight respondents highlighted the difficulty to access appropriate facilities and equipment, with enough space to provide an injection room and a post-injection room. Eighteen respondents mentioned funding issues. One doctor in particular reported that iOAT implementation would require '*adequate and stable funding to provide quality and prompt service delivery, while avoiding waitlists*'. Twelve respondents were concerned with security in the workplace in the case of iOAT implementation. Twelve respondents also considered that service organisation for iOAT would be a challenge in terms of referrals, admission criteria or schedules, for example.

A second category of themes emerged around professional barriers. Thirty-six participants mentioned the lack of available or qualified staff as a barrier to iOAT implementation. One respondent noted that qualified staff should be able to master different kinds of skills, such as technical and interpersonal skills. Another added that iOAT requires a 'complex expertise'.

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Sixteen participants feared a low acceptability of iOAT implementation by professionals and some specifically referred to ongoing prejudice and stigma against patients, the substance, and the route of administration by injection. A nurse mentioned that '*stigma regarding the injection mode of administration might be perceived as encouraging drug use*'. Six respondents raised concerns about staff training.

A third category pertains to physical barriers. Nineteen participants noted that some non-urban areas do not have access to public transportation. Large territories and lack of transportation were therefore identified as obstacles to iOAT provision. One pharmacist noted the '*difficulty to come to the clinic regularly in a remote center such as mine*'.

A fourth category of themes revolves around social barriers. In fact, social acceptability was a concern for nine participants. One doctor stated, '*loitering might bother neighborhood residents. Community workers should be hired to manage relationships*'. Finally, four respondents expressed concerns about managing disappointment for non-eligible patients.

A fifth category brings together 12 participants who perceived no obstacles for iOAT implementation.

The last category of themes gathers isolated themes brought up by 16 participants (Table 8).

Table 8. Analysis of respondents' comments on barriers to iOAT's implementation.

Categories and themes	**Number of participants (*n* = 100)**
1. Organisational barriers	
Room, equipment and facilities	28
Funding	18
Security	12
Service organisation	12
2. Professional barriers	
Available or qualified staff	36
Professional acceptability	16
Staff training	6
3. Physical barriers	
Transportation and large territories	19
4. Social barriers	
Social acceptability	9
Managing disappointment for uneligible patients	4
5. No perceived obstacles	12
6. Other comments	16

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Discussion

Among other factors, implementation of a new intervention depends on the engagement of healthcare professionals. Thus, the aim of this article was to elicit the perspective of OUD professionals in the province of Quebec regarding the appropriateness of iOAT and the obstacles to its implementation, as well as to explore factors that may influence these perspectives. Results highlight overall interest and perceived iOAT appropriateness by OUD professionals in Quebec. Exploratory analyses suggest that participants who perceive iOAT to be very appropriate for their clientele are more likely to report a higher number of patients with biopsychosocial deterioration in their caseload, to consider themselves very familiar with iOAT, to work in higher population density regions. The most common obstacles highlighted by participants pertain to organizational barriers.

The above results are important as they contribute to a very small body of literature on OUD professionals' perspective towards iOAT. While a report of key informant perspectives on heroin-assisted treatment published in 2018 shows limited support for iOAT in a sample of various stakeholders in two American states (Ober et al., 2018), no accounts specific to potential iOAT providers (i.e. OUD professionals) were found in the literature. The objective of this study was to describe the perspective of OUD professionals regarding iOAT in the province of Quebec (Canada), explore variables associated with perceived iOAT appropriateness and document perceived obstacles to iOAT implementation.

Self-reported prior knowledge and perceived appropriateness of iOAT were higher than expected in the study sample. In fact, 80.3% of the sample considered being very familiar or somewhat familiar with iOAT, and 87.6% of respondents reported having an interest in obtaining additional information on iOAT. More than a third of respondents (37.4%) considered iOAT to be partially appropriate for their clientele and the majority of participants (60.7%) reported that iOAT would be very appropriate for their clientele.

In terms of iOAT appropriateness, justifications cited by the respondents are in line with the literature on a theoretical and clinical basis for iOAT, which calls for expanding OAT options to reach and retain refractory patients with multiple comorbidities, to prevent overdose deaths (Connery, 2015) and to reduce harm (Connery, 2015; Plaza et al., 2007). It is also in accordance with the report on some stakeholders' favorable perspectives on iOAT in the United States to improve outcomes for patients having treatment failures (Kilmer et al., 2018). These results should not be surprising, given the current context of the opioid situation in Canada. In fact, the last decades have brought rising trends in opioid prescription, followed by reductions in prescribing, increasing availability of potent opioids on the illicit market, and the associated overdose mortality (Fischer et al., 2019). These have shaped the present opioid crisis that is affecting all Canadian provinces (Fischer et al., 2019). In the last few years, awareness surrounding the opioid crisis, harm reduction strategies, and treatment approaches such as iOAT, has been raised in the media as well as through provincial action plans (MSSS, 2018). Nonetheless, these results are contrasting with those of an American study conducted in 2018, where many stakeholders expressed concerns about iOAT enabling drug use.

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In terms of feasibility, respondents highlighted obstacles such as high requirements of resources, staff, training, transportation, space and equipment to administer iOAT. However, while the many resources necessary to implement iOAT have been brought up by respondents, cost-effectiveness studies show that iOAT may be 'more effective and less costly than methadone among people with chronic opioid dependence refractory to treatment' (Bansback et al., 2018; Nosyk et al., 2012). These results also provide an opportunity to think about the importance of lighter structures for iOAT administration, to overcome obstacles. For instance, take-home doses have been proven feasible, as they have been used historically in the UK (Strang and Gossop, 1996), and have been allowed by regulatory bodies in some jurisdictions during the COVID-19 epidemic in order to mitigate risks associated with the intersection of both public health emergencies (Oviedo-Joekes et al., 2021). Additionally, different types of delivery models (e.g. dedicated vs. pharmacy-based) may require different levels of resources (Eydt et al., 2021).

The issue of security has also been brought up by respondents as a possible implementation obstacle for iOAT. However, it should be noted that results from the North American Opiate Medication Initiative (NAOMI)[1] study on iOAT demonstrated that 'the operation of the NAOMI clinic did not produce any significant impacts on the commission of crime and/or acts of disorder in the neighbourhood's surrounding sites in Vancouver and Montreal' (Lasnier et al., 2010). Finally, some respondents expressed concerns regarding social and professional acceptability. It can nevertheless be noted that these same barriers have been reported as hindrances to access or implementation of other conventional oral OAT and harm reduction initiatives. For instance, obstacles such as staff availability and training (Chou et al., 2016; Edmundson & McCarty, 2006; Fonseca et al., 2018; Wells et al., 2019), regulations (Edmundson & McCarty, 2006; Simpson, 2017; Winstanley et al., 2016), political resistance (Salvador et al., 2020), acceptability, stigma or public opposition (Chou et al., 2016; Fonseca et al., 2018; Salvador et al., 2020; Wells et al., 2019), or far travel (Edmundson & McCarty, 2006) have been documented. Indeed, challenges remain for accessible OAT in many parts of Canada and Quebec, especially in rural and remote areas (Eibl et al., 2017).

Participants who perceive iOAT to be very appropriate for their clientele are more likely to report a higher number of patients with biopsychosocial deterioration. This result is in line with iOAT administration guidelines. In fact, the Canadian Guideline on Injectable Opioid Agonist Treatment for Opioid Use Disorder recommends that iOAT should be offered to patients with severe opioid use disorder and face significant medical or psychiatric risks (CRISM, 2019).

Participants who perceive iOAT to be very appropriate for their clientele are more likely to report being very familiar with iOAT. In this regard, knowledge transfer of iOAT effectiveness and

[1]The NAOMI study is a heroin prescription trial held between 2002 and 2006 in Vancouver and Montreal, Canada.

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clinical implications appears to be pivotal when it comes to fostering engagement of health care professionals and successful implementation.

While iOAT is usually implemented in urban settings, this study documented the perspective of professionals in different geographical settings within the province. Exploratory analyses showed that respondents from higher population density regions were significantly more likely to report being very familiar with iOAT, and to consider iOAT to be very appropriate for their clientele, compared to respondents from lower population density areas. This could be explained in part by the results of an American study on iOAT acceptability, which reports that some professionals consider that urban regions are less conservative, and thus more favorable to iOAT. They also consider that stigma may be smaller in larger cities (Ober et al., 2018). Additionally, higher numbers of PWIO and overdose deaths might contribute to explain these differences. For instance, in the city of Montreal, the population of people who inject drugs is estimated to be close to 4000 individuals (Leclerc et al., 2014), and the city has the highest number of overdose deaths in the province (Perreault et al., 2020). Lastly, a report of key informant perspectives on heroin-assisted treatment shows that support for iOAT might increase in urban settings where strong service provision is already implemented (Ober et al., 2018). Participants' responses suggest that the implementation of high intensity harm reduction treatments such as iOAT are considered more appropriate in areas where the number of eligible patients is high and the harm reduction service network is already well implemented. These results highlight regional differences and support the importance of evaluating local needs and contexts before implementing large-scale standardized programs.

Study limitations and conclusion

This study has some limitations. First, the health care and community workers who decided to participate in the survey are likely to have a positive bias towards iOAT, which would explain the high interest for iOAT in the study sample. In fact, Groves et al. (2004) have demonstrated that people are more likely to participate in surveys of topics of interest to them. Secondly, the relatively small sample size does not allow for expected representation of all professional bodies, especially doctors and pharmacists. Lastly, the results depict the perceptions of the respondents and should be interpreted as such. Nonetheless, the study provides insight into the perspective of OUD professionals regarding iOAT for an important subset of people with OUD who present complex problems and high risk factors despite oral OAT attempts.

In conclusion, the results from this study highlight overall interest and perceived iOAT appropriateness by OUD professionals in Quebec. Participants' comments to open-ended questions stress a harm-reduction framework hindered mostly by organisational level barriers. Thus, future work should include the perspective of program administrators and decision makers, in order to elicit organisational and management facilitators.

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Disclosure statement

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

Author contributors

M. Perreault, ME Goyer and L. Archambault designed the study. J. Sabetti conducted part of the literature review and wrote parts of the manuscript, which were corrected and supplemented by M. Perreault and L. Archambault. M-E Goyer reviewed and commented on the final draft from a clinical perspective.

Data availability statement

Due to the nature of this research, participants of this study did not agree for their individual data to be shared publicly, so supporting data is not available. This is to preserve participant confidentiality.

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