# Factors Influencing Engagement and Utilization of Opium Tincture-assisted Treatment for Opioid Use Disorder: A Qualitative Study in Tehran, Iran

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**Abstract:**

**Introduction and Aims**:

In response to a high burden of opioid use disorder (OUD), Iran established a network of opioid agonist treatment (OAT) centers beginning in 2002. To increase treatment diversity, particularly for patients who use opium as their drug of choice, opium tincture (OT)-assisted treatment was introduced to the network. This study aimed to explore factors influencing OT-assisted treatment selection for OUD in Tehran, Iran.

**Design and Methods**:

We conducted 54 in-depth interviews with patients with OUD (n=33), family members of patients (n=9), and drug treatment providers (n=12). Participants were recruited from 12 drug treatment centers across Tehran, between September and November 2019. All interviews were audio-recorded, transcribed, and coded in OpenCode 4.02 software, and analyzed using thematic analysis.

**Results**:

Study participants more commonly reported individual-level factors as facilitators (e.g., to reduce harms associated with illicit opioid use, achieve recovery through a gradual dose reduction regimen combined with Congress 60 recovery program) and structural level factors (e.g., low adoption by OAT system, and lack of familiarity of treatment providers) as barriers for utilization

of OT-assisted treatment regimens. OT was perceived to produce lower levels of physiological dependence than methadone, but the requirement for twice supervised dosing was restrictive. Low familial and community acceptance were also seen as barriers to access.

**Discussion and Conclusions**:

This research identified a range of perceived benefits for OT-assisted treatment ranging from harm reduction to an intermediate step to achieve recovery. However, several structural, individual, familial, and community-level barriers impede its availability and acceptability.

**Keywords:**

Opioid use disorder; Opium tincture; Treatment; Qualitative study; Barriers

# Factors Influencing Engagement and Utilization of Opium Tincture-assisted Treatment for Opioid Use Disorder: A Qualitative Study in Tehran, Iran

**Running title:**

**Factors Affecting Choosing Opium Tincture Treatment for OUD**

## Introduction

Iran has one of the highest rates of opioid use in the world, with an estimated 2 million people with opioid use disorder (OUD)[1]. Opium is commonly smoked or ingested and is the drug most commonly used in the country[1-2]. An estimated 200,000 people who inject drugs (PWID) live in Iran[3], most of whom report heroin as their drug of choice[4]. The prevalence of HIV and hepatitis C infections among PWID is 9.7% and 45%, respectively[5-6].

In response to the high prevalence of HIV among PWID, Iran began bolstering its harm reduction infrastructure in 2002[7]. This included policies, programs and practices aimed at reducing the harms associated with substance use in people unable or unwilling to stop[8]. While harm reduction programs often target PWID, Iranian studies have shown that people who use opium or heroin through non-injecting routes are at risk of future conversion to injecting drug use[9-10]. There are typically about five years between the time someone initiates illicit opioid use and the time that person turns to injection[10-11]. Furthermore, people who use opioids through non-injection routes are also at increased risk for health harms including lead poisoning from contaminated opium[12] and HIV infection due to high-risk sexual practices[13].

From 2006, the Iranian Drug Control Headquarter (DCHQ) endorsed harm reduction measures that aim to prevent people from transitioning to high-risk patterns of opioids use[14]. Toward this end, the Iranian National Center for Addiction Studies has conducted pilot projects on opium tincture (OT)-assisted treatment. Two different treatment regimens have showed promising results. The first was OT maintenance in which patients substitute their opioid of choice with OT and receive it on a long-term basis[15]. The second regimen was characterized by gradual dose reduction of OT, where after an initial maintenance period clinicians incrementally reduce dosage. Alongside the latter intervention, the patients were encouraged to be active participants of Congress 60, a local mutual-help recovery community[16].

Founded in 1998 in Iran, Congress 60 is a non-governmental organization (NGO) that as of 2015 had over 20,000 members. Differing from other international mutual-help groups, such as Narcotics Anonymous (NA), Congress 60 promotes a simultaneously biological, psychological, social, and spiritual understanding of addiction and recovery[17]. The OT-assisted treatment protocol for OUD was approved in 2011 by the Iranian Ministry of Health. Over the past decade, OT-assisted treatment has gradually been scaled up, so that in March 2018, 94,000 people were on this treatment[18].The global literature on OAT in drug treatment settings has focused on methadone and buprenorphine interventions[19-20] and to a lesser extent, slow-release oral morphine or injectable-opioid agonist treatments[21-22]. This is also true of the literature on OAT in drug treatment settings in Iran[23-24]. A systematic review of the effectiveness of OT-assisted treatment for OUD only found 9 studies from Iran, Thailand, China and France with varying quality[25]. The authors concluded that OT treatment offers promise, though further research is

needed. The current qualitative study aims to investigate factors influencing engagement with and utilization of OT-assisted treatment in the Iranian medical context.

## Methods

### *Study sites*

Data was collected from 12 sites in Tehran. The city's 22 districts were divided into 3 categories – developed, moderately developed, and underdeveloped[26] – based on indicators of urban development. Four treatment facilities were purposefully selected from each district category. Across study sites, drug treatment facilities included outpatient facilities (n=10), residential facilities (n=1) and inpatient facilities (n=1). The outpatient centers were all OAT centers providing treatment with methadone and buprenorphine. Among these 10 OAT centers, seven also provided OT-assisted treatment (Table 1).

**[Insert Table 1 here]**

### *Study design and participants*

In-depth qualitative interviews were conducted with 54 participants, including clients of drug treatment centers (n=33), family members of clients (n=9), and professional treatment providers (n=12). All study participants were recruited between September and November 2019.

### *Client group participants*

Eligibility criteria for participants in the client group included: (1) being 18 years of age or older, (2) having an OUD diagnosis based on DSM-5, (3) seeking treatment for OUD, and (4) being able to provide informed written consent. Amongst clients with OUD, three subgroups were purposefully identified including: (1) individuals who were at the time receiving OT-assisted treatment (n= 14), (2) individuals who had a previous history of receiving OT-assisted treatment but were not receiving OT-assisted treatment at the time of the study (n= 10), and (3) individuals who had no history of OT-assisted treatment (n= 9). These groups were recruited to achieve a mix of clients who had or had not received OT-assisted treatments. While there were fewer women in the participant population, women were purposively sampled to ensure that at least one woman was included in each group.

***Family member and treatment provider participants***

Participants in the family member group (n=9) were selected from the family members of patients receiving drug treatment services for OUD. Eligibility criteria included being a family member of a patient; being older than 18 years of age and being able to provide informed written consent. Treatment providers were recruited across study sites. Purposeful sampling was used to recruit treatment provider participants with a range of educational and clinical backgrounds, as well as those who worked at different tiers of specialized drug treatment services (e.g., outpatient, residential, and inpatient). Eligibility criteria included being a provider at one of the study sites; being 18 years of age or older and being able to provide informed written consent.

***Data collection tool***

The study team developed questionnaires for each of the three groups of study participants. Each questionnaire consisted of two sections: (a) demographic and background information and (b) an in-depth interview guide. The demographic section included questions such as drug use history and current patterns of use for the client group; experiences with different drug treatment approaches for the client and family member groups; and type of services offered for the treatment provider group. Interview guides were developed to include participants' understanding of barriers and facilitating factors for receiving OT-assisted treatments at four levels, including individual, familial, community, and structural levels. Each of the interview guides was piloted with two individuals from each group of study participants (n=6) to check for comprehensibility of the items and to inform the interview process. Interview guides were revised and finalized accordingly.

***Data collection procedures***

Eligible participants were enrolled in the study after providing written informed consent. In-depth, semi-structured interviews were conducted in private rooms located within the drug treatment centers. Interviews were conducted by clinical psychologists with a master-level qualifications, all of who had previous experience working as addiction treatment providers and researchers. The interviewers were not working in the sites where interviews were conducted. All interviewers received a four-hour training session on conducting in-depth interviews. Interviews ranged from 35 minutes to 2.5 hours in length, averaging 72 minutes. Participants were offered short breaks and refreshments during interviews. Participants in client and family groups received a contribution towards their transportation costs of around 2 US dollars. The

study was approved by the Ethics Committee of the Vice-Chancellor in Research Affairs, Tehran University of Medical Sciences (approval ID: IR.TUMS.VCR.REC.1398.465).

***Data analysis***

All interviews were audio-recorded and transcribed verbatim. The transcripts were uploaded into OpenCode 4.02 Software where they were coded and analyzed inductively via iterative categorization. Thematic analysis was undertaken by authors (AN, PB & KC) to identify recurring, converging, and contradictory patterns of perspectives, key concepts, and emerging themes[27].

## Results

The client group included 33 participants ranging from 22 to 69 years of age (average 38.8) and including three women. Most participants were married (n=23), 8 had never married, and 2 were divorced. The completed years of education among individuals in the patient group ranged from 3 to 18 years (average 11.8). In total, 20 people were employed, 10 unemployed, and 3 retired. One of the female participants who initially described herself as unemployed reported obtaining money through sex work. Among 33 individuals in the patient group, 32 lived at home (12 owned the home; 9 lived in family-member's home and did not pay rent; 11 rented) and 1 was living at their workplace most of the time in the preceding year.

Among the client participants, the majority (n=21) reported opioids as their drug of choice in their most recent period of active drug use; the reminder reported both opioids and methamphetamine as their drugs of choice (n=12). Among client participants, 13 reported consuming opium or *Shireh* (refined opium) alone or with prescription opioids (e.g., codeine, tramadol) other than methadone, 13 reported consuming heroin alone or with other opioids, and 7 reported consuming non-prescribed methadone that was obtained on the black market alone or with other opioids (opium, refined opium or prescription opioids) except for heroin.

Family member participants (n=9) were between 36 to 54 years of age (average 46.1) and included 6 women. Participants in this group included parents (n=3), wives (n=3), siblings (n=2), and adult children (n=1) of patients. Family members were unemployed (n=2), employed (n=6), and retired (n=1). Professional treatment providers participants (n=12) were 28 to 55 years of

age (average 45.2) and were predominately men (n=9). They included psychiatrists (n=2), general practitioners (n=7), and clinical psychologists (n=3).

Overall study participants more commonly reported individual-level factors as facilitators in choosing OT-assisted treatment regimens (e.g., desire to reduce harms associated with illicit opioid use, to participate in OT-assisted recovery, and to stabilize psychosocial functions); and structural level factors (e.g., low adoption by OAT system, low familiarity of treatment providers and administrative requirements) as barriers to choosing OT-assisted treatment regimens.

### *1. Facilitators for OT-assisted treatment program*

The majority of participants in all three groups identified one or more advantages for OT-assisted treatment. The broad range of stated advantages included that OT was: "*a specific treatment method that is tailored for people who use opium*", "*an herbal remedy*", "*less physiologically addicting and easier to taper as compared with methadone*", "*less physiologically harmful to the body as compared with abstinence-based treatments*", "*less likely to lead to adverse events (e.g., psychomotor retardation) as compared with methadone*", "*disconnection of patients from the illicit market*", "*lacking impurities*", "*preventing the progression of opium use to heroin*" and "*diversifying treatment options,*".

#### *1.1. Individual-level facilitators*

- ***Perceived benefits of OT-assisted treatment as a harm reduction measure***

Many participants saw OT-assisted treatment as a harm reduction program that could help people who are not willing to cease opioid use to receive a less harmful, licit substitute. Participants also perceived OT-assisted treatment as a public-health intervention that impeded

the progression of opium use to heroin. They believed this treatment could also be an opportunity for health systems to provide patients with other needed services:

"*OT does not have impurities such as lead, so it could help reduce harms associated with illicit opium use…*" [38-year-old male client]

"*It makes these patients visible… it is an opportunity to provide them with other required health services… even motivate them for other [drug] treatments*" [46-year-old male treatment provider]

"*Smoking opium is time-consuming for people who use high amounts of opium in a day. The OT could help these people receive their drugs rapidly and get back to work…"* [50-year-old female family member]

- ***Perceived benefits of OT-assisted treatment as a part of a holistic recovery program***

A group of participants, mainly patients or family members of patients who were receiving OT treatment through Congress 60, viewed Congress 60's treatment method as a "*holistic intervention*". The Congress 60 treatment plan instructs patients to receive a gradual dose reduction of OT within 10-11 months alongside intensive psychosocial interventions and recreational activities (e.g., physical activity and art) led by peers who have themselves recovered through the Congress 60 program.

"*In the Congress 60 treatment model, we believe abrupt cessation of drugs has negative effects on body systems and patients [with OUD] need to receive a [opioid agonist] substitution, such as OT, to stabilize their bodily systems and then gradually taper their dose.*

*Congress 60 says you need to cease using drugs gradually because you have also become addicted gradually.*" [36-year-old male client]

"*They go to the clinic once a week and receive their medication. They also participate in [Congress 60] meetings a few times a week. It helps them to get back to work while receiving their treatment… There [in Congress 60], they learn how to live. They receive positive energy, become more reasonable and accept their faults*" [41-year-old female family member]

- ***To diversify OUD treatment options***

Many participants mentioned that OT treatment provides diversity of pharmacological interventions for people with OUD. However, they noted that several conditions needed to be met for proper implementation of the program, including accompanying it with psychoeducation and administering it alongside professional psychosocial interventions or a comprehensive recovery program (e.g., Congress 60) or keeping OT for patients who have failed in other treatments.

"*A proportion of patients would benefit from OT treatment... Patients who have tried buprenorphine or methadone maintenance treatment and failed might be good candidates for OT-assisted treatment regimens"* [28-year-old female treatment provider]

"*I previously did not have a positive attitude towards opium syrup, but in Congress 60 I learned that it is a medication that helps our body to repair its functions*" [44-year-old male client]

- ***Stabilization of psychosocial status***

Some participants reported that OT-assisted treatment like other oral opioid maintenance treatments helps clients stabilize their psychosocial status through breaking the repeated cycle of intoxication-withdrawal that results from using illicit opioids.

> *"Receiving OT with a distinct dose keeps the patient from experiencing either withdrawal or intoxication. This process has benefits beyond simply reducing the harms associated with illicit opioid use. It improves patients' mental and cognitive functions."* [47-year-old male treatment provider]

- ***Using opium or Shireh as opioid of choice***

Many participants from all three groups reported that OT-assisted treatment regimens are more appropriate for people with opium or *Shireh* use disorder. They mentioned that OT develops "*lower levels of physiologic dependence and [is] easier to taper*" and is associated with "*less adverse events (e.g., psychomotor retardation)*" as compared with methadone. Participants had varying perceptions as to whether OT was effective for people with heroin use disorder.

- ***Older age***

Many participants mentioned that older patients who are not willing or able to cease opioid use are the best candidates for OT-assisted treatments. In contrast, participants who are currently receiving OT-assisted treatment in association with Congress 60 believed that there is no difference with age and all patients could benefit from the treatment. Some participants mentioned that OT should not be used for the treatment of adolescents and youths.

- ***Being male***

Some participants believed that there is no difference between male and female patients and both might benefit from the treatment while some others believed that OT-assisted treatments are more suitable for males. For example, it was said that receiving OT-assisted treatments might be associated with higher stigma among female patients or its alcohol content might be a barrier for use during pregnancy or while breastfeeding.

### *1.2. Familial facilitators:*

- ***Positive families' attitude toward mutual-help organizations***

Some participants believed that intensive education and mutual-help support at Congress 60 allowed families to become more comfortable with its treatment method.

> "*They warmly welcome you and give you hope and confidence… [At Congress 60], you learn that you need to be a fellow-traveler of your traveler [patients are referred as travelers in Congress 60 program]*" [41-year-old female family member]

- ***Familial acceptance***

Some participants mentioned that a negative attitude toward methadone has been developed among families. They felt that OT-assisted treatment was more acceptable than methadone for treatment:

> "*I do not accept methadone as treatment, but I approve OT*" [66-year-old male family member]

## *2. Barriers for OT-assisted treatment program*

### *2.1. Structural barriers*

- ***Low adoption by OAT system:***

Treatment providers reported that a major structural barrier to enrolling in OT was its low availability in OAT treatment centers.

> *OT is somehow like buprenorphine. All [OAT] centers provide methadone, but many of them do not provide buprenorphine. This situation is worse for OT.* [53-year-old male treatment provider]

Many patients mentioned that they had not been offered OT-assisted treatment during their contact with OAT services.

> *Neither this [private] center not the previous center I went to which was a governmental center have offered me OT among their options.* [32-year-old female client]

OT was also not available in correctional facilities, which exclusively provided prisoners with methadone.

- ***Lack of familiarity of treatment providers***

Furthermore, the majority of participants in the treatment provider group perceived a lack of knowledge and skills for working with OT as a factor contributing to the low adoption of OT treatment within OAT centers.

> *We are not familiar with OT treatments and Congress 60's recovery program. Government should provide free of charge continuous medical education courses on this topic* [OT treatment]. [28-year-old female treatment provider]

> *We have other [opioid agonist] treatment methods, which are more extensively researched in the world... we do not know much about OT treatment, so why we should use it*? [46-year-old male treatment provider]

- ***Requirements for receiving OT from OAT centers***

Some participants mentioned that administrative requirements (e.g., regular attendance, strict take-home policies, identity verification, etc.) for receiving opioid medications from OAT centers are among major barriers for accessing OT-assisted treatments:

> *It is difficult for some patients to comply with the requirements that patients regularly attend the clinic to receive doses… Take-home policies are stricter for OT maintenance treatment than methadone.* [29-year-old female treatment provider]

> *"Treatment centers should provide person-centered care and cut any red tape which prevents patients from access to OT treatment."* [54-year-old male family member]

However, some treatment providers expressed concerns regarding liberal policies regarding access to OT medication:

> *It should be noted on one hand that restrictive policies for accessing OT negatively affect the program's attractiveness, on the other hand, that liberal policies [for accessing OT] might negatively affect the program's reputation and increase*

*familial and community resistance to the program.* [45-year-male treatment provider]

Many participants mentioned concerns regarding confidentiality as a barrier to accessing OATs. They believed that patients' confidentiality concerns were even more pronounced for OT treatment, as it is associated with more social stigma than other opioid agonist medications. Even though several patients believed that OT could offer alternatives to other agonist interventions, as mentioned earlier, the majority of patients believed that OT carried greater stigma due to its pharmacological and subjective similarity to illicit opium.

### *2.2. Individual-level barriers*

- ***Being Employed:***

The majority of participants mentioned that receiving OT-assisted treatment regimens might not be appropriate for employed people because they lead to positive morphine tests, require multiple, in person doses during the day, and have stricter take-home policies as compared to other opioid agonist medications.

- ***Medication characteristics***

While some participants mentioned the resemblance of OT to opium was advantageous for attracting enrollment, the majority of participants mentioned that this similarity - in terms of taste, odor and appearance, high sediment in the medication bottle and alcohol content - created barriers to engagement.

> "The a*lcohol content bothers some patients because of their religious beliefs [Islamic ban on alcohol use]*" [37-year male client]

According to the national protocol, patients must consume their medication two to three times a day. This may negatively affect the patient's adherence and interfere with their daily activities, as compared with long-acting opioid agonists such as methadone and buprenorphine.

Some participants mentioned the more serious diversion problem with OT as compared with synthetic opioid agonist medications, as individuals can extract opium from OT, which can then be smoked.

- ***Low familiarity among patients***

The majority of participants reported that low patient familiarity with OT-assisted treatments is a major barrier to this treatment.

- ***Low acceptance among patients***

Many participants reported negative attitudes toward long-term OATs, and with OT in particular, and that this was a major barrier for initiating OT-assisted treatments.

> "*Some patients might say 'I am doing the same thing [using opioids] myself'. It is also true for other opioid agonist medications, although it is worse for OT*" [36-year-old male client]

> "*I am not OK with the opium syrup. It is as if you are using opium itself*…" [41-year-old male client]

> "*[Some people ask] what has changed? We replaced one addiction with another?*" [29-year-old female treatment provider]

- ***Perceived risks***

Some participants reported the following risks as barriers for OT-assisted treatment, including "*having a positive urine test, which might be problematic legally and, in the workplace*", "*opioid adverse events (e.g., constipation and psychomotor retardation*)", and "*accidental overdose by family members.*"

### *2.3. Family level barriers:*

- ***Low familial acceptance***

The majority of participants reported that they thought it was hard for families to accept OT-assisted treatments:

> "*I completely disagree [with opium syrup]. It is like they are consuming opium itself. There is opium in its name. They would say we are using opium syrup so we have the permission to use other drugs.*" [36-year-old female family member]

- ***Low familiarity with families***

Some participants mentioned that many families are not familiar with OT-assisted treatments and they would support it if they received education about its rationale and benefits.

> *Many families are not familiar with benefits of opioid agonist treatments. We could attract their cooperation through education*. [28-year-old female treatment provider]

### *2.4. Community-level barriers:*

- ***Low community acceptance***

The majority of participants mentioned that there was stigma attached to all long-term OATs at the community level and that the community only views "*short-term detoxification*" programs as a legitimate treatment for OUD.

> "*It [OT maintenance] is recognized as a legitimate treatment by the government but it has been less accepted by the community…"* [28-year-old female treatment provider]

> "*The community views it as an opium ration program [opium distribution through pharmacies before the Iranian revolution in 1979] and because of this, they do not like [OT treatment]*" [47-year-old male treatment provider]

Many participants believed that the wider community only accepts short-term interventions (compulsory residential detoxifications) as "*genuine*" treatments.

> "*Any support a person who uses drugs receives comes from mutual-help organizations…the non-drug-using community does not show any support…they see addiction as a crime and not a disease…The community expects sudden and miraculous changes from treatment interventions. This is why they value abstinence-based treatments, which promise a complete cure…*" [47-year-old male treatment provider]

Similar to the concerns of patients of family members, the resemblance of OT with opium, the illicit drug, was perceived as another source of community resistance against it:

> *They view these [opioid agonist medications] as [illicit] drugs. Methadone at least does not have the smell, but when you open the bottle of this [OT], opium smell is spread everywhere. Its stigma is worse than other [opioid agonist] medications*. [34-year-old female client]

- ***The low familiarity of the community***

Some participants believe that if the community understood the benefits of OT treatment, they would more readily accept it.

> "*If the community sees the [positive] change that transpires in people who use opium syrup, they may accept it…*" [37-year-old male client]

- ***Negative messaging about OT from rival markets***

Different treatment ideologies are providing a range of services in Iran's drug treatment landscape. Some participants mentioned that messaging against OATs in general and OT treatment, in particular, might negatively affect patient's treatment choices.

## Discussion

This research described barriers and facilitators for the use of OT-assisted treatment as an alternative to opioid agonist medications in, particularly for people who use opium or people who do not respond to other OATs. Finding alternative treatments to methadone and buprenorphine maintenance treatment is important as not all patients with OUD respond to more mainstream agonist treatments[28]. Some participants perceived OT as a medication that develops lowers levels of physiological dependence and fewer adverse events (e.g., psychomotor retardation) as compared to methadone. The preference to avoid methadone is consistent with

the results of a US study, which revealed that patients' decisions to enroll in buprenorphine treatment were sometimes related to negative attitudes toward methadone[29]. In other contexts (Europe and Canada), alternative opioid agonist treatments such as slow-release morphine and heroin-assisted treatments have been introduced for those who do not respond to standard OATs as well as those who will not accept them[22, 30-31]

Our results showed that patient's preference is one rationale for the addition of OT-assisted treatment to Iran's repertoire of agonist treatments. However, current studies comparing OT with methadone or buprenorphine treatments have not provided between-group comparative data regarding treatment satisfaction and adverse events (e.g., psychomotor retardation)[25, 32-33]. Studies have shown maintenance treatment with slow-release oral morphine a medication with the same active ingredient of OT (i.e., morphine), has fewer physical side events[34,35], lower depression, and anxiety scores[34,36], an enhanced sense of feeling 'normal'[35], and higher treatment satisfaction[36] and acceptability[35] as compared to methadone maintenance treatment. Further studies to compare the safety and treatment satisfaction of OT with other opioid pharmacotherapies are warranted.

Our study participants believed that OT-assisted treatment might have harm reduction benefits for Iran's opioid problem through the safe supply of a medication whose main ingredient is the drug of choice of most people with OUD in the country. It provides a safe, unadulterated supply of opioids for people who are unable or unwilling to cease using illicit opioids. At present, Iran's current OT program is oriented for treatment, as made evident by its restrictive take-home policies. A lower threshold OT program, focused primarily on replacing illicit sources of opium

with licit, may face considerable barriers. As indicated in the paper, people may believe take-home dosing is associated with the diversion of opioid medications to the black market.

In light of the potential benefits of OT treatment, several barriers must be addressed before its widescale adoption. OT maintenance treatment requires patients to obtain supervised doses from the clinic twice a day (mornings and afternoons) and patients can only receive take-home doses after an initial period of stabilization. Requiring patients to make more than one visits per day to a clinic has been noted as a barrier to care in several studies, such as those in Canada that examine injectable diacetylmorphine or hydromorphone treatment programs[37-38].

An additional major barrier that our study identified was that treatment providers were not familiar with OT-assisted treatment regimens and did not feel confident to use them in their clinical practice. This finding underscores the importance of providing training on OT treatments to professionals working in Iranian OAT clinics. The need for training is consistent with a study from the US that showed high-quality training as facilitating the implementation of evidence-based interventions for OUD[39].

Our results also indicated that participants perceived OT treatments as less acceptable for youth as compared to older populations. This is consistent with results from a Canadian study that showed youth who were receiving OATs did not think that agonist medications fitted into their long-term vision of a "*normal*" future[40]. It should be noted that this might be a reflection of higher levels of stigma attached to OATs for younger people[41] and drug treatment professionals' more conservative approach toward OATs among youth, who are believed to have less severe OUD than older populations[42].

There remains a significant stigma against all OAT treatments in Iran. Despite their pharmacological differences, there are similarities between discourses surrounding OT and other agonist treatments. In our research, several participants argued that using OT for treatment is only "*replacing one drug with another.*" In previous studies of other agonist interventions, patients have opposed opioid maintenance treatment because they are "*band-aid solutions*" rather than "*legitimate treatments*"[43-44], even though they have the strongest evidence base of any treatment for OUD. Much of this stigma is due to socio-cultural understandings of what forms of treatments constitute appropriate interventions. Our findings indicated that people in Iran placed a higher value on interventions that promise to "cure" addiction, rather than on interventions that help to maintain addicted individuals through longer-term treatment regimes. For this reason, there appears to be greater popular support and confidence in short-term detoxification programs. This finding points to the need for the government and medical authorities to implement interventions to address OAT stigma throughout the country. It is also essential to note that there remains a significant stigma against OT in comparison to other agonist medication in Iran. We believe that this is because of OT's perceived similarity to illicit opium.

According to some participants, the diversion of OT to the black market is a barrier to the expansion of OT-assisted treatment in Iran. This concern is consistent with previous studies from international settings which report diversion as a challenge for methadone[45-46] and buprenorphine[47-48] treatment programs. Diversion of opioid agonist medications is associated with a range of adverse consequences including opioid dependence, overdose, and compromising of public acceptance of OAT[45].

**Limitations:**

This study had multiple limitations. We recruited study participants only from Tehran, which limits the generalizability of our results to other parts of Iran. The small sample size with diverse roles and socioeconomic background could potentially limit the generalizability of our results.

In services involved in this study, participants receiving OT dose reduction regimens were encouraged to attend in Congress 60. A group of study participants perceived the combination of OT-assisted treatment with the Congress 60 recovery program as a comprehensive and effective treatment for OUD. It is not possible to determine their attitudes to OT separately from their attitudes to Congress 60. Congress 60 mutual-help recovery has been influential in introducing OT-assisted treatment to patients and their families in Iran. Many large cities in Iran have one or more branches of the Congress 60 program. However, other cities still do not have this. To increase generalizability of the findings, we recruited participants from a range of OAT centers across Tehran both with and without experience in collaborating with Congress 60.

Comparative data regarding the effectiveness of different OT-assisted treatment regimens are limited[25]. Further studies to investigate the safety and effectiveness of OT-assisted treatment regimens as compared with standard opioid pharmacotherapies in a range of delivery systems are needed.

## Conclusions

Our findings suggest that OT serves as a useful addiction to Iran's repertoire of OATs and could be an alternative to methadone, particularly for individuals who use opium. However, several structural, individual, familial and community level barriers impede its availability and acceptability.

Our findings highlight the need in Iran to educate the public and health professionals on the role of OT in achieving life stability in people with OUD. This may include education that "*recovery*" can be a process rather than a short-term goal. Long-term OATs, which may include OT, can help patients feel a sense of "normality" as they work on their recovery. OT can provide an option for individuals who desire alternatives to other readily available agonists on the market, such as methadone and buprenorphine. Though it is constrained by its need for twice daily dosing. Further studies and clinical trials are need to better assess the costs and benefits of OT on the patient experience.

**Author statement file**

Study design: AN, BM, HN & AK, data gathering: MS, AV & NC, data analysis: AN, KC & PB, draft manuscript: AN, PB, KC & NC. All authors reviewed the draft manuscript and contributed to the final manuscript.

**Declaration of interest**

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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