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Factors associated with interest in receiving prison-based methadone maintenance therapy in Malaysia

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Abstract

Introduction—Methadone maintenance therapy (MMT) is crucial for HIV prevention and treatment in people who inject opioids. In Malaysia, a large proportion of the prison population is affected by both HIV and opioid use disorders. This study assessed individual preferences and factors associated with interest in receiving MMT among male prisoners meeting criteria for opioid dependence in Malaysia.

Methods—A convenience sample of 96 HIV-positive and 104 HIV-negative incarcerated men who met pre-incarceration criteria for opioid dependence was interviewed using a structured questionnaire to examine participant characteristics and attitudes toward MMT. Factors associated with interest in prison-based MMT initiation were identified using logistic regression analysis.

Results—Among all participants, 85 (42.5%) were interested in receiving MMT within prison. Independent correlates of interest in prison-based MMT were being previously married (AOR = 4.15, 95% CI: 1.15, 15.02), previously incarcerated (AOR = 5.68, 95% CI: 1.54, 21.02), depression (AOR = 3.66, 95% CI: 1.68, 7.98), daily heroin use in the 30 days prior to incarceration

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Conflicts of interest

None.

Authors contributors

Authors Mukherjee, Wickersham, Pillai, Altice and Kamarulzaman designed the study and wrote the protocol. Mukherjee undertook the statistical analysis under the supervision of Wickersham, Desai and Altice, and wrote the first draft of the manuscript. All authors contributed to and have approved the final manuscript.

(AOR = 5.53, 95% CI: 1.65, 18.58), and more favorable attitudes toward MMT (AOR = 19.82, 95% CI: 6.07, 64.74).

Conclusions—Overall, interest in receiving prison-based MMT was low, and was associated with adverse social, mental health, and drug use consequences. Incarceration provides a unique opportunity to initiate MMT for those who need it, however, optimal scale-up efforts must be systemic and address modifiable factors like improving attitudes toward and motivation for MMT. Informed or shared decision-making tools may be useful in improving expectations and acceptability of MMT.

Keywords

HIV; Prisoners; Malaysia; Opioid dependence; Methadone; Patient preferences

1. Introduction

Opioid use disorders remain a serious public health problem, particularly in Southeast Asia. Recent estimates suggest there are approximately 3.2 million people who inject drugs (PWIDs) in East and Southeast Asia, of which 205,000 (170,000–240,000) reside in Malaysia (United Nations Office on Drugs and Crime, 2014). In 2013 alone, opioid users accounted for the overwhelming majority (75.1%) of the 20,887 newly registered drug users in Malaysia, and the number of new opioid users has continued to increase, doubling from 8,472 in 2012 to 16,035 in 2013, while the use of other drugs have remained mostly unchanged (National Drug Agency, 2013). Moreover, drug injection has continued to fuel the HIV epidemic in Malaysia, with approximately 20% of all PWID living with HIV (Bazazi et al., 2015; Ministry of Health, 2010; Vijay et al., 2015). Compared to the rest of Southeast Asia, Malaysia reports the highest (0.94%) prevalence of opioid use (United Nations Office of Drugs and Crime, 2014), and has failed to reach both its 2015 goal of being a drug-free society and its Millennium Development Goal of halting the spread of HIV (Ministry of Health, 2011; United Nations Office of Drugs and Crime, 2008).

In an effort to reduce the incidence of HIV, the Malaysian government introduced methadone maintenance treatment (MMT) as a harm reduction program in 2006; however, coverage has remained under 5% among registered opioid users in Malaysia (Degenhardt et al., 2014; Ministry of Health, 2013). Instead, a long history of punitive and abstinence-based drug policies has continued to persist, and approximately 45% of all prison inmates in Malaysia are convicted on drug charges (Kamarulzaman, 2009a; Zahari et al., 2010). Incarcerating this high risk group, without access to MMT, needle/syringe programs (NSP) or condoms has led to a tremendous increase in the number of people who are opioid dependent and living with HIV in prison (Ministry of Health, 2011; United Nations Office of Drugs and Crime, 2010; Zahari et al., 2010). Recognizing this as a public health problem, Malaysia adopted a more progressive stance on prison-based harm reduction, and since 2010 has made MMT available in 12 of its 39 prisons. Evidence from the United States, Australia and Malaysia have demonstrated numerous benefits of initiating MMT within prison for primary and secondary HIV prevention, including increased adherence to antiretroviral therapy (ART) and viral load suppression for those that are HIV-infected (Altice et al., 2011, 2010; Farrell et al., 2005; Gowing et al., 2013; Kamarulzaman, 2009a; Springer and Bruce,

2008; Wolfe et al., 2010). MMT initiated prior to release also has the potential to reduce needle -sharing within prison, prevent relapse to drug use and death from overdose after release (Binswanger et al., 2007; Dolan et al., 2003, 2005; Gordon et al., 2012; Stallwitz and Stover, 2007). Additionally, MMT has proven successful in reducing the rates of criminal behavior and recidivism, as well as ensuring continuity of care and retention in treatment post-release (Binswanger et al., 2007; Bruce et al., 2007; Dolan et al., 2003, 2005; Gordon et al., 2012, 2008; Keen et al., 2000; Kinlock et al., 2009, 2007; Springer et al., 2012; Stallwitz and Stover, 2007). Therefore, a prison-based, pre-release MMT program provides a valuable public health opportunity to treat opioid dependence and prevent HIV transmission (Gowing et al., 2013; Wickersham et al., 2013a, 2013b).

Despite the growing body of evidence supporting within-prison methadone, undesirable side effects of methadone, lack of physician training, and law enforcement practices that interfere with MMT after release have led to suboptimal implementation of MMT within prisons in Malaysia (Culbert et al., 2016; Wickersham et al., 2013a, 2013b). HIV prevention and treatment are currently underscaled in Malaysia with under 5% of HIV-infected PWID receiving either ART or MMT (Degenhardt et al., 2014). Few prisons in Malaysia provide comprehensive HIV prevention and treatment services, and a previous study reported that less than half (48.4%) of those eligible received ART in Malaysia's largest prison, but only in the context of an ongoing research study (Bick et al., 2013). Currently, only about 200 of the 40,000 prisoners eligible for treatment are receiving MMT, leaving considerable room for scale-up (Kamarulzaman, 2009b; Wickersham et al., 2013a, 2013b). Scale-up of evidence-based treatments, such as MMT is central to HIV prevention efforts in prison, yet both individual and organizational factors, including patient preferences, play a role in MMT acceptability (Knudsen et al., 2011). Identifying individual-level factors related to interest in initiating MMT within prison provides insights into identifying potential candidates who may have more successful treatment outcomes and greater retention to care. Alternatively, identifying those less interested or uninterested in receiving MMT, and implementing informed decision-making interventions to motivate them for treatment, provides new directions for scale-up of MMT (Coulter et al., 1999).

Uptake of MMT in Malaysia has been suboptimal, and an enormous gap still exists between those who need treatment and those who actually receive treatment. Consequently, it is important to identify preferences and attitudes toward MMT among prisoners in Malaysia. Thus, the objective of this study was to identify individual-level factors associated with interest in initiating MMT within prison. Understanding factors associated with treatment interest may help to target treatment initiatives and identify the barriers and facilitators of engaging incarcerated persons in treatment.

2. Materials and methods

2.1. Study design

A cross-sectional study was conducted between June and August 2014 in Malaysia's largest prison (Kajang Prison), located 30 kilometers outside of the federal territory of Kuala Lumpur. Due to operational and logistical constraints, access was limited to the male section of the prison.

2.2. Study sample and data collection

The study sample included 200 male prisoners meeting pre-incarceration criteria for opioid dependence (Wickersham et al., 2015). Participants met eligibility criteria if they were aged 18 years or older, met the DSM-V screening criteria for opioid dependence, had been incarcerated for at least 30 days in Kajang, able to speak English or Bahasa Malaysia, and were able to provide informed consent. Foreign residents and those sentenced to capital punishment were excluded, as they are not eligible to receive MMT under Malaysian law. HIV testing upon entry into prison is mandatory in Malaysia, and those that are HIV-positive are segregated in a separate cellblock. We attempted to recruit equal numbers of HIV-positve and HIV-negative inmates, and ultimately enrolled 96 participants that were HIV-positive and 104 participants that were HIV-negative. All participants were recruited using information sessions provided in each cellblock. Those interested in learning more about the study were brought to the medical unit inside the prison where study eligibility was assessed, and informed consent was obtained. All study screening and informed consent activities were conducted by trained research assistants who were unaffiliated with the prison. Additionally, informed consent and study procedures were completed in a private room, without the presence of prison officials, and participants were not compensated. All data were collected through the use of structured interviews lasting approximately 45 minutes, and were conducted in either English or Bahasa Malaysia by trained research assistants. This study was approved by the ethics committees at both Yale University and the University of Malaya, and was completed in accordance with Malaysian Prisons Department regulations.

2.3. Study measures

The primary outcome was interest in receiving MMT while in prison, which included those that answered “yes” to the question “If you are not receiving methadone treatment at this moment, would you like to receive it?” as well as those that were currently receiving MMT in prison.

A broad range of correlates related to interest in prison-based MMT were examined, including sociodemographic characteristics, incarceration history, co-morbid conditions, drug use history, and psychosocial factors. Sociodemographic characteristics included age, ethnicity, religion, marital status, and highest level of education completed. Monthly income prior to incarceration was dichotomized as ≤1000 MYR or ≥1001 MYR, roughly corresponding to Malaysia’s poverty line income (Hatta and Ali, 2013). Incarceration history included variables reflecting prior incarceration in prison and compulsory drug detention centers (CDDC).

HIV status was obtained from prison medical records after enrollment. Depression was assessed using the 10-item Clinical Epidemiological Scale for Depression (CES-D), with scores >10 being associated with major depression (Andresen et al., 1994).

Prior substance use, drug injection practices, MMT utilization and HIV risk behaviors were self-reported. Participants who reported using more than three types of drugs in a day during the 30 days prior to incarceration were defined as polysubstance users. Heroin use during the

30 days prior to incarceration was categorized as none, intermittent if they used heroin more than never, but less than daily, or daily.

Psychosocial measures included addiction severity, treatment readiness, opioid use stigma and attitudes toward methadone. Addiction severity was assessed using the DAST-10, with scores >5 dichotomized as high (Skinner, 1982). General treatment readiness for addiction was assessed using SOCRATES-8D, which consists of three subscales measuring recognition of problems related to drug use, ambivalence of a drug use problem, and taking steps toward making positive changes related to drug use (Miller and Tonigan, 1996). Opioid use stigma was assessed using an adapted version of an abridged Berger HIV Stigma Scale, in which phrases such as 'I have HIV' were replaced with 'I use heroin or other opioid drugs' (Berger et al., 2001; Jeyaseelan et al., 2013). Subscale measures of opioid use stigma included disclosure concerns, negative self-image, public attitudes, and personalized stigma related to opioid drug use. Finally, questions assessing attitudes toward MMT were adapted from the standardized Attitudes toward Methadone Scale developed by Schwartz et al. (2008), and previously validated in Malaysia (Vijay et al., 2015). A summary score measuring MMT attitudes was divided into quartiles, with the lowest and the highest quartiles defined as low or high levels of favorable attitudes toward MMT, respectively. The interquartile groups were defined as having moderate levels of favorable attitudes toward MMT.

2.4. Data analysis

Descriptive statistics were used to characterize the study sample. Next, we assessed bivariate associations between the independent variables and interest in receiving MMT using Pearson's chi-squared test (for categorical variables) or Student's ***t***-test (for continuous variables) as appropriate. We then performed a multiple logistic regression analysis to identify independent correlates of interest in receiving MMT. All independent variables significantly associated with the outcome at the $p < 0.10$ level in bivariate analyses were initially entered into the model, and then we used a backward elimination strategy (retaining variables significant at the $p < 0.05$ level) to derive the most parsimonious model. Finally, we used Pearson's chi-squared test to determine which specific attitudes toward methadone were significantly correlated with interest in MMT. All data analysis was completed using IBM SPSS Statistics version 22 (SPSS Inc., Chicago, IL, USA) and SAS version 9.3 (SAS Institute Inc., Cary, NC, USA).

3. Results

Characteristics of the study sample are summarized in Table 1. The mean age of participants was approximately 41 years, with the majority of participants being ethnically Malay (71.0%), Muslim (77.5%), and having never married (65.0%). Approximately one-third of the sample reported earning an income below the national poverty level (29.1%) and polysubstance use (36.0%). The majority of participants reported having been previously incarcerated (86.9%) or detained in a CDDC (59.8%), and nearly half (48.2%) had previously received MMT for their opioid dependence. Over half (60.0%) met criteria for

high addiction severity, two-thirds (66.5%) reported daily heroin use in the 30 days prior to incarceration, and 49.5% reported injecting heroin in the 30 days prior to incarceration.

Less than half (42.5%) of participants indicated interest in receiving MMT within prison, but only 18 (21.2%) of the 85 participants interested were currently receiving it. As the bivariate results in Tables 1 and 2 show, interest in MMT was associated with marital status, prior history of incarceration, depression, previous use of MMT, polysubstance use, lifetime history of injection drug use, increasing frequency of heroin use, stigma associated with public attitudes and personalized stigma, and more favorable attitudes toward MMT ($p < 0.10$). In the multivariable analysis (Table 2), interest in MMT was significantly associated with being married and previous history of incarceration in prison. MMT interest was also higher among those that are depressed, used heroin daily, and those that had moderate or high levels of favorable attitudes toward methadone maintenance treatment ($p < 0.05$).

Table 3 describes the proportion of participants who agreed with each statement addressing individual attitudes toward MMT. Overall, interest in MMT was associated with greater likelihood of endorsing positive attitudes and decreased likelihood of endorsing negative attitudes toward treating opioid dependence with MMT. For example, among those interested in MMT, 90.6% agreed with the statement, “Methadone therapy is the best way to treat opioid addiction,” compared with 64.3% of those not interested in MMT ($p < 0.001$). In contrast, 18.8% of those interested in MMT agreed with the statement, “My religious beliefs do not permit me to use methadone as a treatment for my drug addiction,” compared with 32.2% of those not interested in MMT ($p = 0.034$).

Finally, we also examined commonly perceived barriers to receiving MMT in prison. While 28.0% of participants cited not knowing how to request MMT in Kajang, 25.5% stated that the hours for receiving MMT were not convenient for them, 24.0% said there was a long wait list to enroll in the program, 24.0% said prison officials were not aware of their opioid dependence, and 22.0% stated not knowing there was a MMT program available within the prison.

4. Discussion

While general attitudes towards MMT have been previously described among HIV-infected Malaysian prisoners (Bachireddy et al., 2011), to our knowledge, this is the first study to systematically examine factors related to interest in receiving methadone treatment among prisoners since it has been introduced into the prison system. Findings here suggest that less than half of opioid dependent prisoners would be willing to enroll in MMT within prison, despite meeting criteria for treatment. Overall low levels of MMT treatment interest may be explained by cognitive dissonance between opioid relapse and re-incarceration, and a misunderstanding of addiction as a chronic, relapsing disease. Previous studies in Malaysia and Ukraine have found that the majority of prisoners with a history of opioid dependence did not perceive drug relapse as a challenge to community re-entry, and did not recognize MMT as being a helpful measure in preventing relapse (Choi et al., 2010; Morozova et al., 2013). This may in part be explained by misperceptions endorsed by prisoners and prison staff, that forced abstinence during incarceration is an effective treatment option (Mitchell et

al., 2016; Mazhnaya et al., 2016). This perception neither recognizes that addiction is a chronic and relapsing disease, nor considers that addiction is not adequately treated when a person is detained in a controlled environment such as a prison, hospital or drug treatment unit that does not utilize evidence-based treatments. Despite this perception, 85% of released prisoners meeting pre-incarceration criteria for opioid dependence relapse within 12 months, especially during the first two weeks and are more likely to suffer from adverse consequences such as overdose and death (Binswanger et al., 2007). Therefore, recognition of the cycle of relapse and recidivism may serve as a potential treatment motivator, and the criminal justice system plays an important role in facilitating MMT initiation.

Findings here also suggest that prisoners who have experienced more negative consequences related to their drug use, which is analogous to addiction severity, were more interested in initiating MMT. Specifically, willingness to initiate MMT within prison was related to having had previous adverse legal consequences, evidenced by their prior incarcerations, and higher addiction severity, evidenced by their daily use of heroin. Similarly, Rounsaville and Kleber (1985) found that treatment-seeking opioid users were more likely to have co-morbid depression and drug-related social instability. This may partially explain how those with higher depressive symptoms and those whose marriages had resulted in divorce, possibly related to their drug use, were more likely to be interested in MMT. Moreover, those who experience more negative consequences related to their drug use may have greater recognition of their drug use as a problem, and the perception of hitting ‘rock bottom,’ may also serve as a treatment motivator (Mazhnaya et al., 2016).

Similar to findings among prison personnel in Ukraine, this study also found that more favorable attitudes toward methadone was positively correlated with interest in receiving MMT for opioid dependence within prisons (Polonsky et al., 2015). Specifically, those with the most favorable attitudes had almost twenty times higher odds of interest in MMT compared to those with the least favorable attitudes. Even moderate increases in favorable attitudes toward MMT increased the odds of a prisoner’s interest in receiving MMT 8-fold. Although it is generally known that those with better attitudes toward MMT will have better treatment outcomes (Bachireddy et al., 2014; Rich et al., 2005; Vijay et al., 2015), findings here provide specific guidance on which factors need to be addressed through education and awareness campaigns. For those with less favorable attitudes toward MMT, shared decision-making aids may prove useful in increasing knowledge of MMT as a potential treatment for opioid addiction, and may allow clients to make an informed decision about whether to enroll in MMT. The practice of learning accurate information paired with active decision making has been associated with patients making better choices about treatment that benefit their health (Clancy and Cronin, 2005).

There has been an increasing emphasis on patient preferences in healthcare decision-making, (Department of Health, 2008) with impressive advances in creating decision aids to support informed patient choices (O’Connor et al., 2009). Culturally sensitive patient preference decision aids are also effective even for patients with low health literacy, such as within the prison population (Coulter and Ellins, 2007; Krahn and Naglie, 2008; Padon and Baren, 2011). Data consistently confirm that patients who actively engage in the decision-making process experience an empowerment effect and ultimately receive their preferred

treatment. Those who improve their attitudes toward treatment through an informed decision-making process may become more motivated to adhere to the treatment, may tolerate more side effects and inconveniences, and may achieve better outcomes (Brewin and Bradley, 1989; King et al., 2005; McPherson et al., 1997; Torgerson et al., 1996). Furthermore, favorable attitudes towards methadone treatment have been shown to increase retention to care, which has important implications upon community re-entry (Kayman et al., 2006). A systematic review and meta-analysis suggests that preferences, which are amendable to intervention, positively affect patient outcomes in trials of multiple diseases, with those receiving their preferred treatment demonstrating better outcomes (Preference Collaborative Review Group, 2008). Together, these data support creation and deployment of informed decision-making tools that target MMT attitudes in order to increase interest in prison-based MMT. Moreover, attitudes and beliefs about MMT may markedly influence engaging in treatment, making it important to directly address and reduce the negative perceptions about MMT in order to foster treatment expansion. This has important implications for future public health interventions that aim to increase treatment motivation and MMT scale-up in Malaysia.

Malaysia continues to be among the six countries that account for half of the global population of PWID and high prevalence of HIV among them (Degenhardt et al., 2014). The recent shift from punitive to evidence-based approaches for treatment by providing MMT within prisons has allowed Malaysia to take a progressive stance against HIV. Nevertheless, only about 200 of the 40,000 inmates eligible for treatment are receiving MMT within prison. A number of logistical and operational constraints contribute to this low rate of MMT utilization within prisons in Malaysia (Wickersham et al., 2013a). Firstly, prison-based MMT programs globally remain mostly as pilot programs, and prisons are only able to serve a small portion of those that are eligible (United Nations Office on Drugs and Crime (UNODC), 2012). Additionally, Malaysia's prison-based MMT program is relatively new, and the Malaysian Ministry of Health has been slow to train clinicians and pharmacists to deliver MMT in prison settings, resulting in a shortage of human resources. Moreover, the high rates of attrition of both prison staff and inmates reduces familiarity in treating addiction with MMT, and makes it difficult for inmates to initiate and maintain MMT. Finally, the process for enrolling in the prison-based MMT program is not transparent, and many inmates are unaware of the programs existence, or how to receive treatment. Consequently, incarceration continues to act as a barrier to health-seeking behavior and health service delivery by limiting the provision of MMT for those that are interested in treatment (Degenhardt et al., 2014), and scale up of MMT is essential for prison-based MMT to truly be effective as a harm reduction strategy.

Outside of prison, people who use drugs continue to face a number of structural barriers that may inhibit seeking evidence-based treatment with methadone. In Malaysia, MMT users must register with the government, which impedes their ability to gain employment, and reinforces the 'drug user' label for the duration of treatment (Needle and Zhao, 2010). Additionally, police frequently wait outside MMT clinics and target patients for stop and frisk searches, subjecting registered users to additional stigma, discrimination, and harassment that may hinder their desire to initiate treatment (Wickersham et al., 2013b). In contrast, MMT initiated within prison may overcome some of these initial barriers to

beginning treatment in the community, and may increase retention to care (Kinlock et al., 2009). A recent study from Ukraine suggests that during incarceration, prisoners meeting criteria for opioid dependence are more optimistic about recovery than those who have been recently released, suggesting that aligning MMT with recovery would be an important goal (Polonsky et al., 2016). This is especially true since much of the ability to introduce MMT in countries like Malaysia has been linked to harm reduction, including terms like substituting one addiction for another to reduce, but not linked to effective addiction treatment that targets recovery. Ultimately, an integrated treatment and prevention approach in which MMT is prescribed at optimal doses, and combined with NSP, educational and behavioral interventions, condom distribution and ART is needed to reduce drug use and prevent future disease transmission (Wickersham et al., 2013b; Metzger and Navaline, 2003).

4.1. Strengths and limitations

Despite the many important findings from this study, it is not without limitations. Participants were not selected at random and were sampled from a single prison, raising concerns about external validity. Kajang Prison, however, is the largest prison in Malaysia, and the study sample includes both HIV-positive and HIV-negative inmates, thus findings are likely generalizable to a large proportion of individuals incarcerated in Malaysia's prisons. Additionally, the sample only contains inmates from a male correctional facility, restricting our knowledge of any unique factors that may impact women's interest in MMT. Future studies should seek to study attitudes toward MMT and interest in prison-based MMT among women who use drugs. Finally, this study relied solely on self-reported data and results may be subject to social desirability bias. Self-report, however, is often reliable and the high levels of risk reported by this sample suggest social desirability responses were limited. Nonetheless, this study provides important insight into factors associated with interest in receiving MMT among prisoners in Malaysia who would otherwise benefit from treatment, and provides important insights into how to overcome resistance to treatment for opioid addiction.

4.2. Conclusions

Given the large proportion of drug users and people living with HIV incarcerated in Malaysia, the criminal justice system provides a unique window of opportunity to initiate methadone maintenance treatment as a primary and secondary HIV prevention strategy. When combined with other harm reduction approaches, MMT may reduce many other negative consequences of untreated opioid use disorders such as unemployment, overdose and acquisition of other sexual and blood-borne infections (Altice et al., 2010). Evidence here suggests that interest in MMT initiation is largely influenced by social, legal and psychological problems related to drug use and incarceration. More specifically, the findings from this study demonstrate that being married, previously incarcerated, having depressive symptoms, daily heroin use, and favorable attitudes toward MMT are significantly associated with interest in prison-based methadone treatment. Further investigation into patient preferences and how treatment motivation affects MMT interest is warranted, especially in the context of prisons where pre-release initiation of MMT has the highest likelihood of positive post-release outcomes (Kinlock et al., 2009; Rich et al., 2015; Wickersham et al., 2013b). Despite continuous efforts to introduce MMT to prisons,

successful MMT uptake will require directly addressing treatment attitudes, and systematic barriers preventing the expansion of MMT programs within prison (Wickersham et al., 2013a), which are currently absent in the prison setting.

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Table 1

Participant characteristics (N = 200).

Characteristics	Overall N (%)	Interest in Receiving Methadone		p-value*
		Yes	No	
		N = 85 (42.5%)	N = 115 (57.5%)	
Ethnicity				0.341
Malay	142 (71.0)	65 (45.8)	77 (54.2)	
Indian	35 (17.5)	12 (34.3)	23 (65.7)	
Other	23 (11.5)	8 (34.8)	15 (65.2)	
Religion				0.822
Islam	155 (77.5)	66 (42.6)	89 (57.4)	
Hindu	26 (13.0)	12 (46.2)	14 (53.8)	
Other	19 (9.5)	7 (36.8)	12 (63.2)	
Marital status				0.074
Currently married	47 (23.5)	14 (29.8)	33 (70.2)	
Never married	130 (65.0)	58 (44.6)	72 (55.4)	
Previously married	23 (11.5)	13 (56.5)	10 (43.5)	
Highest level of education completed				0.679
Primary	38 (19.0)	17 (44.7)	21 (55.3)	
Some high school	66 (33.0)	28 (42.4)	38 (57.6)	
High school	76 (38.0)	34 (44.7)	42 (55.3)	
University	20 (10.0)	6 (30.0)	14 (70.0)	
Monthly income below poverty level[a]				0.483
Yes	58 (29.1)	27 (46.6)	31 (53.4)	
No	141 (70.9)	58 (41.1)	83 (58.9)	
Prior history of incarceration[a]				0.003
Yes	173 (86.9)	81 (46.8)	92 (53.2)	
No	26 (13.1)	4 (15.4)	22 (84.6)	
Prior commitment to compulsory drug detention center (CDDC)[a]				0.071
Yes	119 (59.8)	57 (47.9)	62 (52.1)	
No	80 (40.2)	28 (35.0)	52 (65.0)	
HIV status				0.360
HIV-positive	96 (48.0)	44 (45.8)	52 (54.2)	
HIV-negative	104 (52.0)	41 (39.4)	63 (60.6)	
Depression[a]				0.061
Yes	88 (44.7)	44 (50.0)	44 (50.0)	
No	109 (55.3)	40 (36.7)	69 (63.3)	
Prior methadone use[a]				0.041
Yes	93 (48.2)	48 (51.6)	45 (48.4)	
No	100 (51.8)	37 (37.0)	63 (63.0)	
Poly-substance use in the 30 days prior to incarceration				0.027

Characteristics	Overall N (%)	Interest in Receiving Methadone		p-value*
		Yes	No	
		N = 85 (42.5%)	N = 115 (57.5%)	
Yes	72 (36.0)	38 (52.8)	34 (47.2)	
No	128 (64.0)	47 (36.7)	81 (63.3)	
Ever injected drugs[a]				0.002
Yes	136 (69.7)	68 (50.0)	60 (50.0)	
No	59 (30.3)	17 (28.8)	42 (71.2)	
Injected heroin in the 30 days prior to incarceration				0.258
Yes	99 (49.5)	48 (56.5)	51 (44.3)	
No	101 (50.5)	37 (43.5)	64 (55.7)	
Frequency of heroin use in 30 days prior to incarceration				0.003
None	31 (15.5)	5 (16.1)	26 (83.9)	
Intermittent	36 (18.0)	14 (38.9)	22 (61.1)	
Daily	133 (66.5)	66 (49.6)	67 (50.4)	
Addiction severity				0.144
Low	80 (40.0)	29 (36.3)	51 (63.8)	
High	120 (60.0)	56 (46.7)	64 (53.3)	
Positive attitudes toward methadone maintenance treatment (MMT)[a,b]				<0.001
Low	50 (25.4)	8 (16.0)	42 (84.0)	
Moderate	103 (52.3)	47 (45.6)	56 (54.4)	
High	44 (22.3)	28 (63.6)	16 (36.4)	
		Interest in Receiving Methadone		
Characteristics	Overall mean ± SD	Yes	No	p-value*
		N = 85 (42.5%)	N = 115 (57.5%)	
Age (years)	40.9 ± 9.0	40.6 ± 8.9	41.1 ± 9.1	0.703
Treatment readiness				
Recognition	27.1 ± 3.2	27.6 ± 2.7	26.8 ± 3.5	0.099
Ambivalence	14.6 ± 2.0	14.7 ± 1.9	14.5 ± 2.1	0.530
Taking steps	31.0 ± 4.0	31.3 ± 3.6	30.8 ± 4.2	0.458
Opioid use stigma				
Disclosure concerns	14.7 ± 2.0	14.9 ± 2.0	14.6 ± 2.0	0.193
Negative self-image	14.1 ± 2.1	14.2 ± 2.3	14.0 ± 2.0	0.476
Public attitudes	14.7 ± 2.1	15.0 ± 2.3	14.4 ± 2.0	0.054
Personalized stigma	22.0 ± 3.6	22.6 ± 3.9	21.6 ± 3.3	0.057

Note: Percentages may not sum to 100% due to rounding.

*P-value for X^2 test for categorical variables or *t*-test for continuous variables.

[a]Numbers may not sum to 200 due to missing data.

[b]Based on mean summary score.

Table 2

Correlates of interest in receiving methadone in prison.

	Bivariate Analysis			Final Model		
Characteristics	**Unadjusted OR***	**95% CI**	**p-value**	**Adjusted OR****	**95% CI**	**p-value**
Marital status						
Currently Married	1.00	–	–	1.00	–	–
Never Married	2.15	1.03, 4.50	0.043	1.72	0.70, 4.23	0.241
Previously Married	3.20	1.12, 9.11	0.029	4.15	1.15, 15.02	0.030
Prior history of incarceration	4.53	1.48, 13.84	0.008	5.68	1.54, 21.02	0.009
Depression	1.75	0.97, 3.15	0.062	3.66	1.68, 7.98	0.001
Prior methadone maintenance treatment (MMT)	1.82	1.02, 3.23	0.041	–	–	–
Poly-substance use in the 30 days prior to incarceration	1.93	1.07, 3.46	0.027	–	–	–
Ever injected drugs	2.77	1.45, 5.29	0.002	–	–	–
Frequency of heroin use in 30 days prior to incarceration						
None	1.00	–	–	1.00	–	–
Intermittent	4.06	1.15, 14.39	0.030	2.91	0.72, 11.86	0.135
Daily	6.66	2.19, 20.27	<0.001	5.53	1.65, 18.58	0.006
Opioid use stigma (public attitudes)	1.15	1.00, 1.31	0.048	–	–	–
Opioid use stigma (personalized stigma)	1.08	1.00, 1.18	0.049	–	–	–
Attitudes towards methadone maintenance treatment (MMT)						
Low	1.00			1.00		
Moderate	4.34	1.84, 10.21	<0.001	7.82	2.87, 21.29	<0.001
High	11.25	4.06, 31.17	<0.001	19.82	6.07, 64.74	<0.001

*Unadjusted odds ratio (OR) for variables in Table 1 significant at $p < 0.10$.

†Final model includes all variables significant at $p < 0.05$ (N = 186).

Table 3

Attitudes towards methadone maintenance treatment (MMT).

Agreed with the following statement:	Overall N (%)	Interest in Receiving Methadone		p-value[a]
		Yes	No	
		N = 85 (42.5%)	N = 115 (57.5%)	
Methadone therapy is the best way to treat opioid addiction	151 (75.5)	77 (90.6)	74 (64.3)	<0.001
Being on methadone therapy would improve the quality of my life	146 (73.0)	77 (90.6)	69 (60.0)	<0.001
Methadone therapy is only replacing one addiction for another[b]	149 (74.5)	67 (78.8)	82 (71.3)	0.228
Methadone therapy is bad for a person's health[b]	100 (50.3)	25 (29.8)	75 (65.2)	<0.001
Being on methadone therapy would help me avoid becoming imprisoned	140 (70.0)	71 (83.5)	69 (60.0)	<0.001
People should try to get off of methadone therapy as soon as they can	143 (71.5)	62 (72.9)	81 (70.4)	0.698
Being on methadone therapy would keep me from injecting	156 (78.0)	75 (88.2)	81 (70.4)	0.003
Methadone therapy encourages people to use more of other drugs[b]	92 (46.2)	34 (40.5)	58 (50.4)	0.164
People look down on those in methadone therapy[b]	64 (32.2)	22 (26.2)	42 (36.5)	0.123
Doctors who prescribe methadone treat addicts poorly[b]	35 (17.6)	13 (15.3)	22 (19.3)	0.463
My religious beliefs do not permit me to use methadone as a treatment for my drug addiction[b]	53 (26.5)	16 (18.8)	37 (32.2)	0.034

[a] P-value for χ^2 test for categorical variables.

[b] Reversed for mean score calculation.